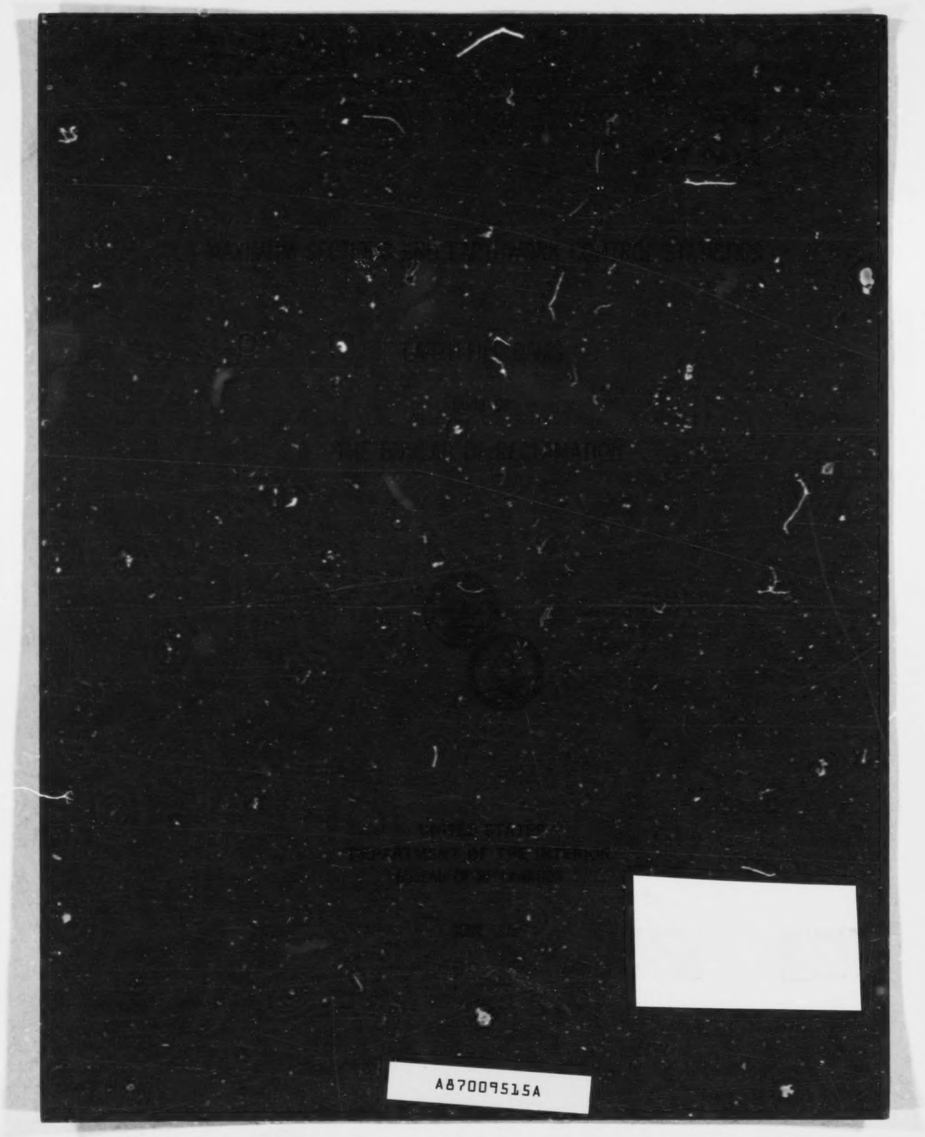
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EXPLANATION

Capacity: Total reservoir capacity is the space in the reservoir exclusive of surcharge capacity.

Length: Extent of barrier in dam and integral features constructed between natural abutments.

Volume: Space occupied by all material in the embankment.

Capacity followed by 1/ indicates active capacity only.

Dam names followed by 1/ designate storage or diversion dams.

Volume or length values followed by 1/ include dikes.

Values of capacity, length and volume shown in parenthesis are estimated values.

Where project encompasses two states, the state in which the dam is located is underlined.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

WESTERN UNITED STATES
SHOWING LOCATION OF

BUREAU OF RECLAMATION EARTH-FILL DAMS

50 0 50 100 150
SCALE OF MILES

LOCATION INDEX
OF
BUREAU OF RECLAMATION EARTH-FILL DAMS

NAME OF DAM	LOCATION NO.	MAX. SECTION ON SHEET NO.
AGATE	168	17
AGENCY VALLEY	31	3
ALAMOGORDO	39	3
ALCOVA	34	3
ALTUS	55	4
AMERICAN FALLS	25	2
ANDERSON RANCH	57	4
ANGOSTURA	65	5
ANITA	40	3
ARBUCKLE	169	16
AVALON	1	1
BELLE FOURCHE	2	1
BIG SANDY	98	8
BLUE MESA	147	13
BUCA	45	4
BONNY	84	7
BUTTLE HOLLOW	167	18
BOX BUTTE	58	5
BOYSEN	78	6
BULL LAKE	41	3
BULLY CREEK	148	13
BUMPING LAKE	7	1
CABALLO	42	3
CACHUMA	93	7
CARPINTERIA RES.	103	8
CARTER LAKE	94	7
CASCADE	66	5
CASITAS	121	9
CAUSEY	157	14
CANKER CITY DIKE	163	15
CEDAR BLUFF	85	7
CHENEY	149	13
CLARK CANYON	154	14
CLE ELUM	30	3
CLEAR LAKE	8	1
COLD SPRINGS	5	1
CONCONULLY	9	1
CONTRA LOMA	170	17
CRANE PRAIRIE	53	4
CRAWFORD	143	12
CRESCENT LAKE	117	9
CUTTER	171	18
DAM NO. 2	110	8
DAM NO. 13	111	8
DAVIS	59	5
DEAVER	20	2
DEER CREEK	49	4
DEER FLAT	3	1
DEERFIELD	60	5
DICKINSON	86	7
DIXON CANYON	70	6
DOWNS DIKE	164	15
DRY FALLS (SO. COULEE)	71	6
ECHO	28	3
EKLUTNA	ALASKA	16
ELEPHANT BUTTE DIKE	17	2
EMIGRANT	130	11
ENDERS	72	6
FLATIRON	97	7
FONTENELLE	155	14
FORT COBB	131	11
FOSS	132	11
FRESNO	45	4
FRUITGROWERS	50	4
GLEN ANNE	100	8
GLENDO	118	9
GLEN ELDER	162	15
GRANBY	67	5
GRASSY LAKE	47	4
GRAY REEF	139	12
GREEN MOUNTAIN	51	4
GUERNSEY	26	2
HAYSTACK	122	9
HEART BUTTE	79	6
HELENA VALLEY	126	10
HERON	173	18
HORSETOOTH	73	6
HOWARD PRAIRIE	123	10
HUNTINGTON NORTH	172	16
HYRUM	32	3
ISLAND PARK	43	3
JACKSON GULCH	80	6
JACKSON LAKE DIKE	12	1
JAMESTOWN	104	8
JOES VALLEY	174	15
KACHESS	10	1
KEECHELUS	16	2
KEENE CREEK	127	10
KEYHOLE	99	8
KIRWIN	105	8
LAHONTAN	13	1
LAKE ALICE	14	1
LAURO	101	8
LEMON	150	13
LEWISTON	151	13
LITTLE PANOCHE	177	16
LITTLE WOOD RIVER	133	11
LION LAKE DIKES	81	6
LONG LAKE	74	6
LOS BANOS	175	16
LOST CREEK	176	15
LOVEWELL	119	9
LOWER TWO MEDICINE	178	17
MANN CREEK	179	16
MARSHALL FORD DIKE	48	4
MARTINEZ	68	5
MARYS LAKE DIKES	69	5
MASON	180	17
MCKAY	23	2
MCMILLAN	6	1
MEDICINE CREEK	82	6
MEEKS CABIN	181	17
MERRITT	152	13
MIDVIEW	35	3
MINITARE	18	2
MINIDOKA	4	1
MOON LAKE	36	3
NAVAJO	134	11
NELSON DIKES	22	2
NEWTON	61	5
NORMAN	158	14
NORTH	89	7
NORTON	159	14
OCHOCO	90	7
OLYMPUS	83	6
O'NEILL FOREBAY	161	14
ORTEGA RES.	106	8
O'SULLIVAN	75	6
PACTOLA	107	8
PALISADES	113	9
PALO VERDE	124	10
PAONIA	137	11
PATHFINDER DIKE	11	1
PICACHO NORTH	114	9
PICACHO SOUTH	115	9
PILOT BUTTE	27	2
PINEVIEW	33	3
PISHKUN DIKES	29	3
PLATORO	91	7
PRINEVILLE	135	11
PROSSER CREEK	138	11
RATTLESNAKE	102	8
RED WILLOW	144	12
RIFLE GAP	182	16
RUEDI	183	16
RYE PATCH	37	3
SALMON LAKE	51	2
SANFORD	153	13
SAN JACINTO RES.	64	5
SAN LUIS	160	14
SATANKA DIKE	87	7
SCOFIELD	62	5
SENATOR WASH	184	16
SHADEHILL	88	7
SHADOW MOUNTAIN	63	5
SHEEP CREEK	140	12
SHERBURNE LAKE	19	2
SHERMAN	141	12
SILVER JACK	186	17
SLY PARK	116	9
SODA LAKE DIKE	95	7
SOLDIER CANYON	76	6
SOLDIER CREEK	165	18
SPRING CANYON	77	6
SPRING CREEK DEBRIS	156	14
STAMPEDE	187	18
STARVATION	166	18
STEINAKER	142	12
STRAWBERRY	15	1
STUBBLE FIELD	112	8
SUGAR LOAF	185	17
TAYLOR PARK	38	3
TIBER	108	8
TIETON	24	2
TOA VACA	PUERTO RICO	18
TRACTON	92	7
TRINITY	128	10
TWIN BUTTES	145	12
TWITCHELL (VAQUERO)	125	10
UNITY	44	3
VALLECITO	52	4
VEGA	129	10
WANSHIP	120	9
WASCO	136	11
WEBSTER	109	8
WHISKEYTOWN	146	12
WICKUP	54	4
WILLARD	188	15
WILLOW CREEK-MONTANA	56	4
WILLOW CREEK-COLORADO	96	7

THIS DRAWING SUPERSEDES DRAWING No. 103-D-577.

8-30-73	ADDED DAMS STARTED BETWEEN 1957 AND 1970
5-340	

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

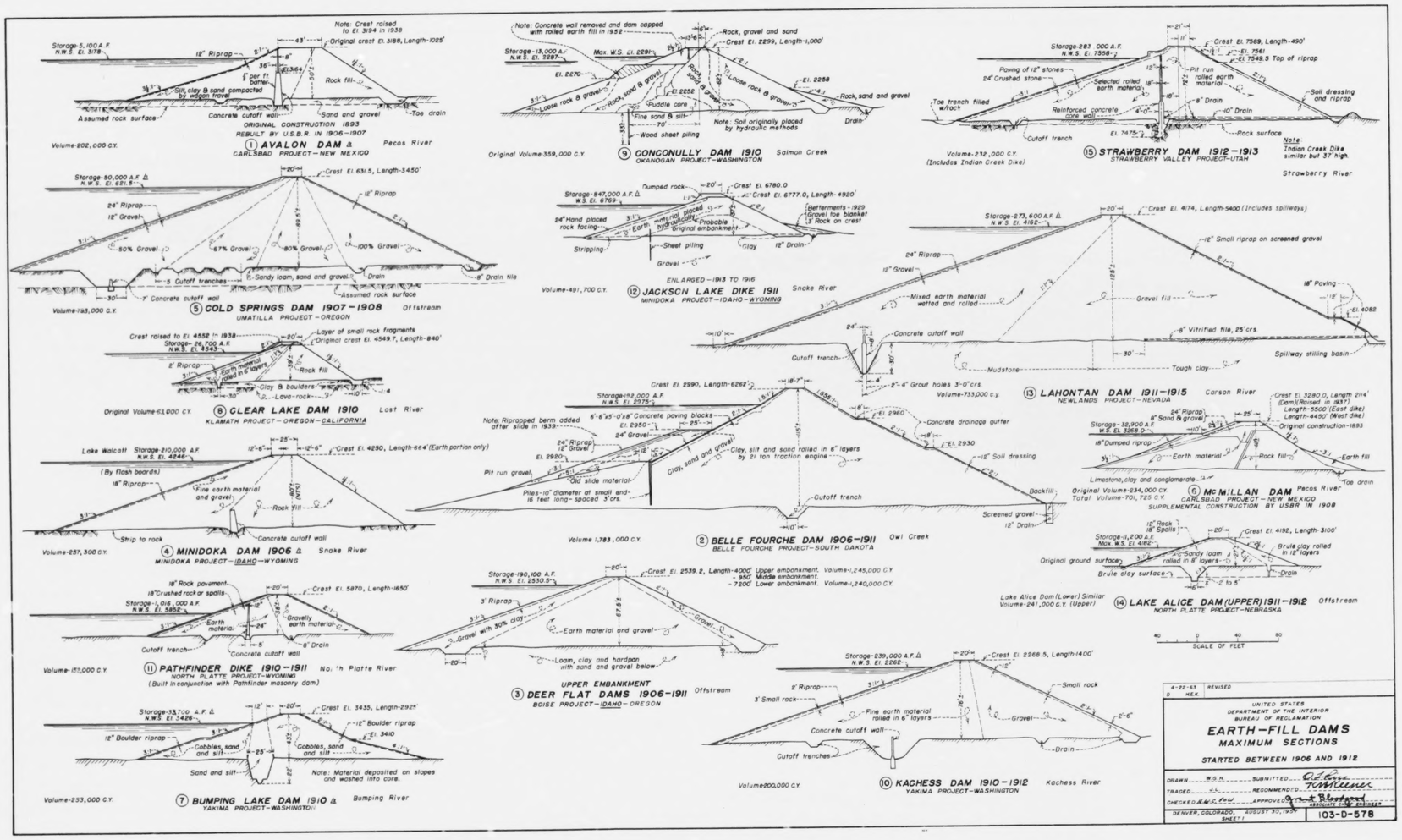
EARTH-FILL DAMS
LOCATION INDEX

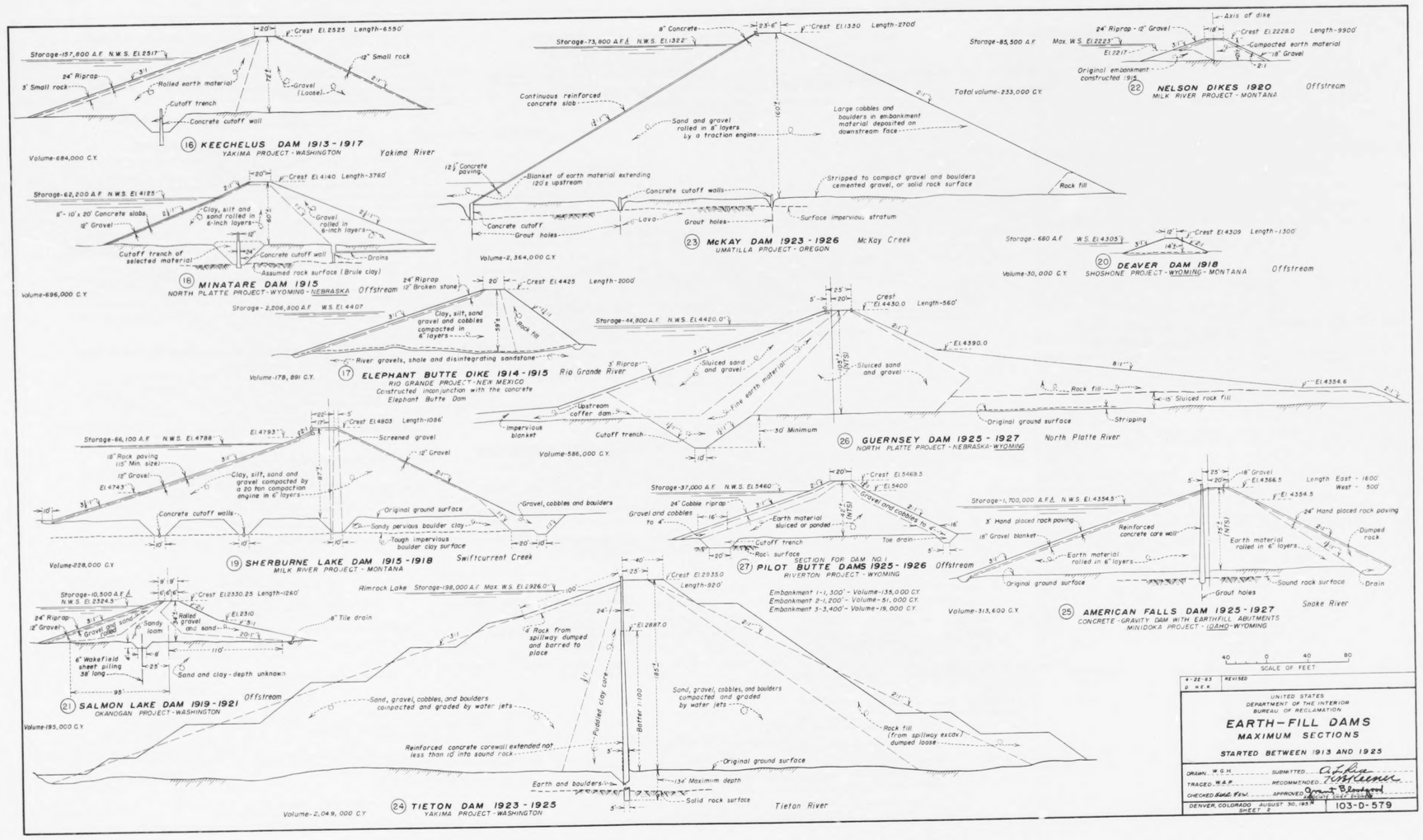
DRAWN H.E.K. SUBMITTED
TRACED RECOMMENDED
CHECKED APPROVED

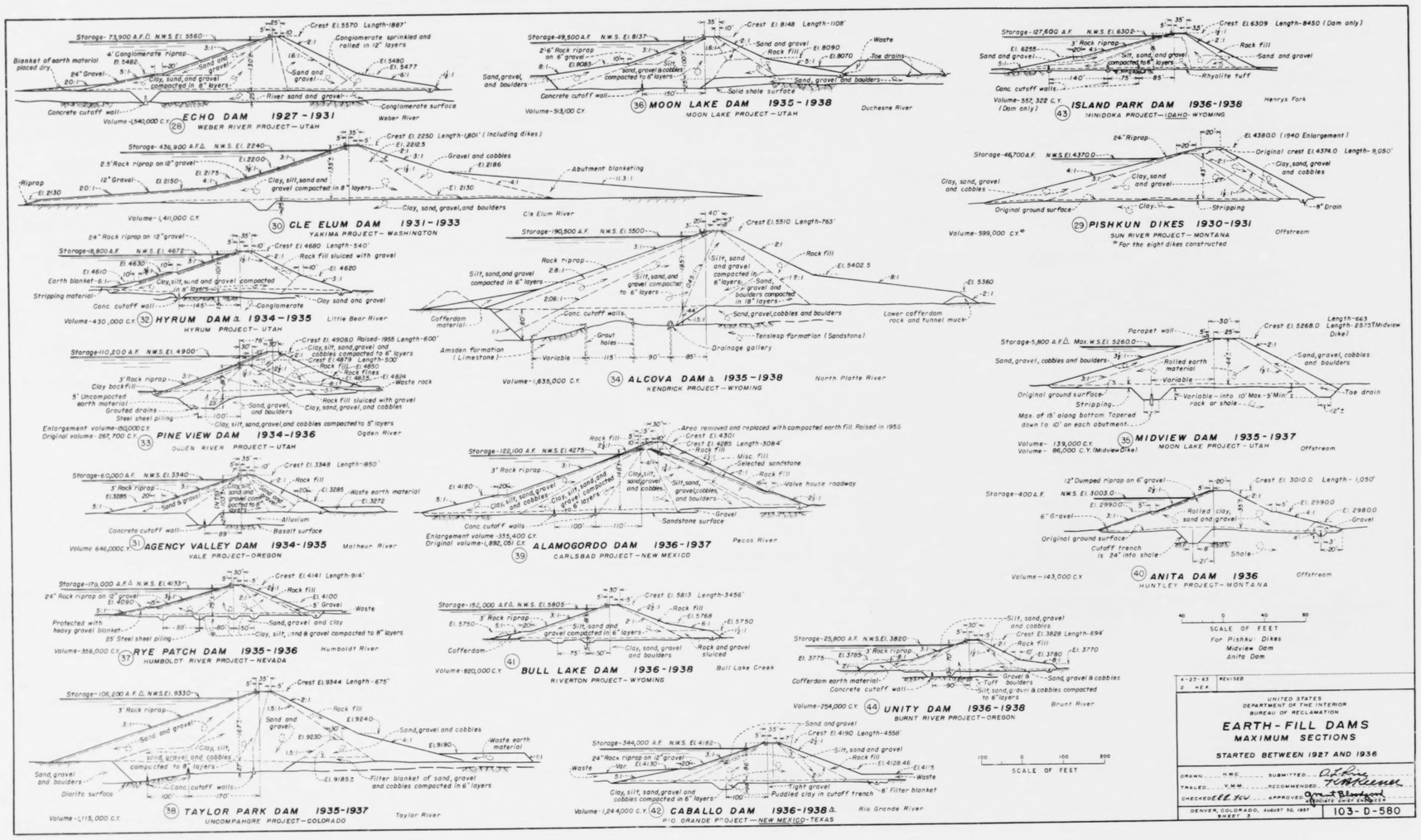
DENVER, COLORADO, APRIL 18, 1969

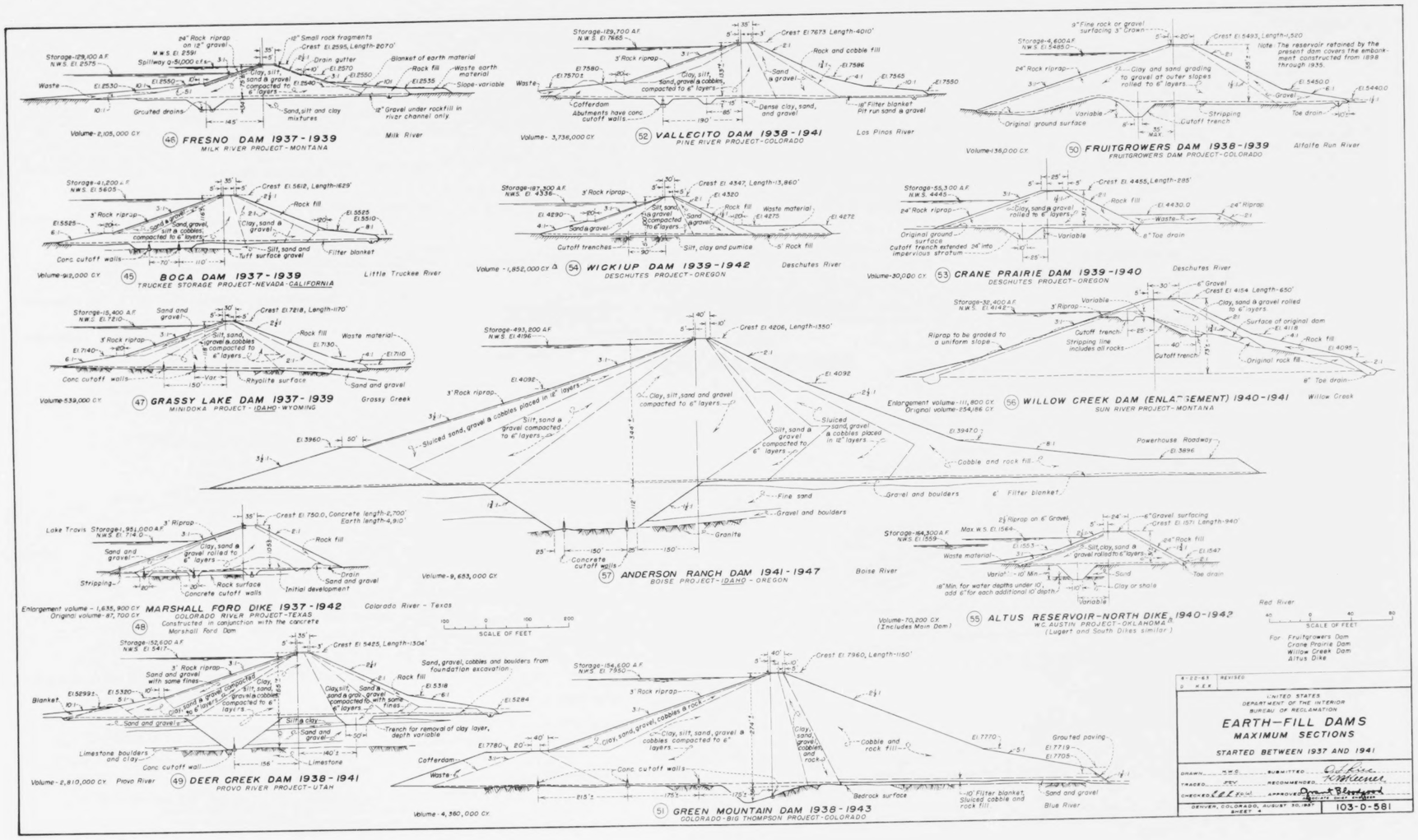
103-D-825

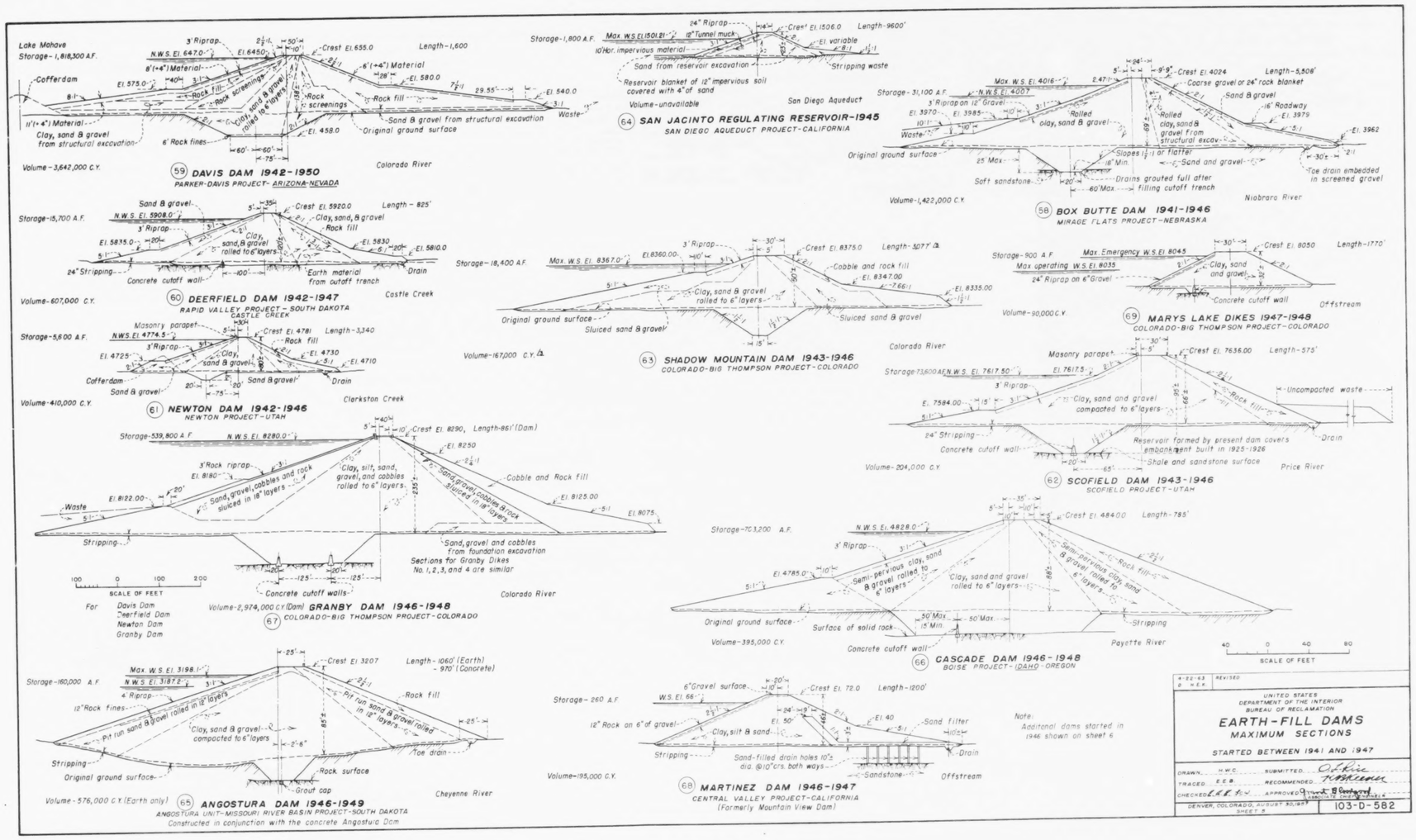
A870095154


Storage-5,100 A.F.
N.W.S. El. 378
18" Riprap
Soil, clay & sand compacted by wagon travel
Assumed rock surface
Concrete cutoff wall
Sand and gravel
Toe drain
Rock fill
Note: Crest raised to El. 3194 in 1938
Original crest El. 3188, Length-1025'
ORIGINAL CONSTRUCTION 1893
REBUILT BY U.S.B.R. IN 1906-1907
Volume-202,000 C.Y.
(1) AVALON DAM Δ Pecos River
CARLSBAD PROJECT—NEW MEXICO
Storage-50,000 A.F. Δ
N.W.S. El. 621.5
Crest El. 631.5, Length-3450'
24" Riprap
12" Gravel
18" Riprap
50% Gravel
67% Gravel
80% Gravel
100% Gravel
Sandy loam, sand and gravel
Drain
8" Drain tile
5 Cutoff trenches
7' Concrete cutoff wall
Assumed rock surface
Volume-743,000 C.Y.
(5) COLD SPRINGS DAM 1907-1908 Offstream
UMATILLA PROJECT—OREGON
Crest raised to El. 4552 in 1938
Storage-26,700 A.F.
N.W.S. El. 4542
Layer of small rock fragments
Original crest El. 4549.7, Length-840'
8' Riprap
Earth material rolled in 6" layers
Rock fill
Clay & boulders
Lava rock
Original Volume-63,000 C.Y.
(8) GLEAR LAKE DAM 1910 Lost River
KLAMATH PROJECT—OREGON—CALIFORNIA
Lake Walcott Storage-210,000 A.F.
N.W.S. El. 4246
(By flash boards)
18" Riprap
Fine earth material and gravel
Rock fill
Strip to rock
Concrete cutoff wall
Crest El. 4250, Length-664' (Earth portion only)
Volume-257,300 C.Y.
(4) MINIDOKA DAM 1906 Δ Snake River
MINIDOKA PROJECT—IDAHO—WYOMING
18" Rock pavement
18" Crushed rock or spalls
Storage-1,016,000 A.F.
N.W.S. El. 5852
Earth material
Gravelly earth material
Cutoff trench
Concrete cutoff wall
8" Drain
Crest El. 5870, Length-1650'
Volume-159,000 C.Y.
(11) PATHFINDER DIKE 1910-1911 North Platte River
NORTH PLATTE PROJECT-WYOMING
(Built in conjunction with Pathfinder masonry dam)
Storage-33,700 A.F. Δ
N.W.S. El. 3426
12" Boulder riprap
Cobbles, sand and silt
Sand and silt
Crest El. 3435, Length-2925'
El. 3410
Note: Material deposited on slopes and washed into core.
Volume-253,000 C.Y.
(7) BUMPING LAKE DAM 1910 Δ Bumping River
YAKIMA PROJECT-WASHINGTON
Note: Concrete wall removed and dam capped with rolled earth fill in 1952
Storage-13,000 A.F.
N.W.S. El. 2287
Max. W.S. El. 2291
El. 2270
Rock, gravel and sand
Crest El. 2299, Length-1,000'
Loose rock & gravel
El. 2256
Rock, sand & gravel
Puddle core
Fine sand & silt
Wood sheet piling
Note: Soil originally placed by hydraulic methods
Drain
Original Volume-359,000 C.Y.
(9) CONCONULLY DAM 1910 Salmon Creek
OKANOGAN PROJECT—WASHINGTON
Storage-847,000 A.F. Δ
W.S. El. 6769
Dumped rock
Crest El. 6780.0
Crest El. 6777.0, Length-4920'
24" Hand placed rock facing
Earth
Hydraulic fill
Probable original embankment
Betterments-1929
Gravel toe blanket
3' Rock on crest
Stripping
Sheet piling
Clay
12" Drain
Gravel
ENLARGED—1913 TO 1916
Volume-491,700 C.Y.
(12) JACKSON LAKE DIKE 1911 Snake River
MINIDOKA PROJECT—IDAHO—WYOMING
Storage-192,000 A.F.
N.W.S. El. 2975
Crest El. 2990, Length-6262'
Note: Riprapped berm added after slide in 1939
6'-6"x5'-0"x8" Concrete paving blocks
El. 2950
24" Riprap
12" Gravel
El. 2920
Pit run gravel
Old slide material
Piles-10" diameter at small end-16 feet long-spaced 3' crs.
Clay, sand and gravel
Clay, silt and sand rolled in 6" layers by 21 ton traction engine
Cutoff trench
Backfill
Screened gravel
12" Drain
Volume 1,783,000 C.Y.
(2) BELLE FOURCHE DAM 1906-1911 Owl Creek
BELLE FOURCHE PROJECT-SOUTH DAKOTA
Storage-190,100 A.F.
N.W.S. El. 2530.5
Crest El. 2539.2, Length-4000' Upper embankment. Volume-1,245,000 C.Y.
-950' Middle embankment.
-7200' Lower embankment. Volume-1,240,000 C.Y.
3' Riprap
Gravel with 30% clay
Earth material and gravel
Gravel
Loam, clay and hardpan with sand and gravel below
UPPER EMBANKMENT
(3) DEER FLAT DAMS 1906-1911 Offstream
BOISE PROJECT—IDAHO—OREGON
Storage-239,000 A.F. Δ
N.W.S. El. 2262
Crest El. 2268.5, Length-1400'
2' Riprap
3' Small rock
Fine earth material rolled in 6" layers
Concrete cutoff wall
Cutoff trenches
Gravel
Drain
Small rock
Volume-200,000 C.Y.
(10) KACHESS DAM 1910-1912 Kachess River
YAKIMA PROJECT-WASHINGTON
Storage-273,600 A.F. Δ
N.W.S. El. 4182
Crest El. 4174, Length-5400 (Includes spillways)
12" Small riprap on screened gravel
24" Riprap
12" Gravel
Mixed earth material wetted and rolled
Gravel fill
18" Paving
12"
El. 4082
Concrete cutoff wall
Cutoff trench
8" Vitrified tile, 25' crs.
Mudstone
Tough clay
Spillway stilling basin
2'-4" Grout holes 3'-0" crs.
Volume-733,000 C.Y.
(13) LAHONTAN DAM 1911-1915 Carson River
NEWLANDS PROJECT—NEVADA
Storage-282,000 A.F.
N.W.S. El. 7558
Crest El. 7569, Length-490'
El. 7561
El. 7549.5 Top of riprap
Paving of 12" stones
24" Crushed stone
Pit run rolled earth material
Selected rolled earth material
Reinforced concrete core wall
8" Drain
10" Drain
Soil dressing and riprap
Toe trench filled w/rock
Cutoff trench
El. 7475
Rock surface
Volume-232,000 C.Y. (Includes Indian Creek Dike)
(15) STRAWBERRY DAM 1912-1913
STRAWBERRY VALLEY PROJECT-UTAH
Note
Indian Creek Dike similar but 37' high.
Strawberry River
Storage-32,900 A.F.
W.S. El. 5868.0
Crest El. 3280.0, Length 2114' (Dam) Raised in 1937)
Length-5500' (East dike)
Length-4450' (West dike)
24" Riprap
6" Sand & gravel
Original construction-1893
18" Dumped riprap
Earth material
Rock fill
Earth fill
Limestone, clay and conglomerate
Toe drain
Original Volume-234,000 C.Y.
Total Volume-701,725 C.Y.
(6) McMILLAN DAM Pecos River
CARLSBAD PROJECT—NEW MEXICO
SUPPLEMENTAL CONSTRUCTION BY USBR IN 1908
Storage-11,200 A.F.
Max. W.S. El. 4182
12" Rock
8" Spalls
Crest El. 4192, Length-3100'
Original ground surface
Sandy loam rolled in 8" layers
Brule clay rolled in 12" layers
Brule clay surface
Drain
2 to 5
Lake Alice Dam (Lower) Similar
Volume-241,000 C.Y. (Upper)
(14) LAKE ALICE DAM (UPPER) 1911-1912 Offstream
NORTH PLATTE PROJECT—NEBRASKA
40 0 40 80
SCALE OF FEET
4-22-63 REVISED
D H.E.K.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1906 AND 1912
DRAWN W.S.H. SUBMITTED
TRACED RECOMMENDED
CHECKED APPROVED
ASSOCIATE CHIEF ENGINEER
DENVER, COLORADO, AUGUST 30, 1938
SHEET 1
103-D-578


Storage-157,800 A.F. N.W.S. El.2517
Crest El.2525 Length-6550'
Small rock
24" Riprap
3' Small rock
Rolled earth material
Gravel (Loose)
Cutoff trench
Concrete cutoff wall
Volume-684,000 C.Y.
16 KEECHELUS DAM 1913-1917
YAKIMA PROJECT - WASHINGTON
Yakima River
Storage-62,200 A.F. N.W.S. El.4125
Crest El.4140 Length-3760'
8'-10' x 20' Concrete slabs
12" Gravel
Clay, silt and sand rolled in 6-inch layers
Gravel rolled in 6-inch layers
Cutoff trench of selected material
Concrete cutoff wall
Drains
Assumed rock surface (Brule clay)
Volume-696,000 C.Y.
18 MINATARE DAM 1915
NORTH PLATTE PROJECT - WYOMING - NEBRASKA
Offstream
Storage-2,206,800 A.F. W.S. El.4407
Crest El.4425 Length-2000'
24" Riprap
12" Broken stone
Clay, silt, sand gravel and cobbles compacted in 6" layers
Rock fill
River gravels, shale and disintegrating sandstone
Volume-178, 891 C.Y.
17 ELEPHANT BUTTE DIKE 1914-1915
RIO GRANDE PROJECT - NEW MEXICO
Constructed in conjunction with the concrete Elephant Butte Dam
Rio Grande River
Storage-66,100 A.F. N.W.S. El.4788
El.4793
Crest El.4803 Length-1086'
Screened gravel
12" Gravel
18" Rock paving (15" Min. size)
12" Gravel
El.4743
Clay, silt, sand and gravel compacted by a 20 ton compaction engine in 6" layers
Concrete cutoff walls
Original ground surface
Sandy pervious boulder clay
Tough impervious boulder clay surface
Gravel, cobbles and boulders
Volume-228,000 C.Y.
19 SHERBURNE LAKE DAM 1915-1918
MILK RIVER PROJECT - MONTANA
Swiftcurrent Creek
Storage-10,500 A.F. N.W.S. El.2324.5
Crest El.2330.25 Length-1260'
24" Riprap
12" Gravel
Gravel fill
Sandy loam
Rolled gravel and sand
El.2310
8" Tile drain
6" Wakefield sheet piling 38' long
Sand and clay - depth unknown
Volume-195,000 C.Y.
21 SALMON LAKE DAM 1919-1921
OKANOGAN PROJECT - WASHINGTON
Offstream
Storage-73,800 A.F. N.W.S. El.1322'
8" Concrete
Crest El.1330 Length-2700'
Continuous reinforced concrete slab
Sand and gravel rolled in 8" layers by a traction engine
Large cobbles and boulders in embankment material deposited on downstream face
Total volume-233,000 C.Y.
12" Concrete paving
Blanket of earth material extending 120'± upstream
Concrete cutoff walls
Stripped to compact gravel and boulders cemented gravel, or solid rock surface
Rock fill
Concrete cutoff
Grout holes
Lava
Grout holes
Surface impervious stratum
Volume-2,364,000 C.Y.
23 McKAY DAM 1923-1926
UMATILLA PROJECT - OREGON
McKay Creek
Storage-44,800 A.F. N.W.S. El.4420.0'
Crest El.4430.0 Length-560'
El.4390.0
El.4354.6
3' Riprap
Sluiced sand and gravel
Fine earth material
Sluiced sand and gravel
Rock fill
15' Sluiced rock fill
Impervious blanket
Upstream coffer dam
Cutoff trench
Original ground surface
Stripping
30' Minimum
Volume-586,000 C.Y.
26 GUERNSEY DAM 1925-1927
NORTH PLATTE PROJECT - NEBRASKA-WYOMING
North Platte River
Storage-37,000 A.F. N.W.S. El.5460
Crest El.5469.5
El.5400
24" Cobble riprap
Gravel and cobbles to 4"
Earth material sluiced or ponded
Gravel and Cobbles to 4"
Cutoff trench
Toe drain
Rock surface
SECTION FOR DAM NO. 1
Embankment 1-1,300' - Volume-135,000 C.Y.
Embankment 2-1,200' - Volume-51,000 C.Y.
Embankment 3-3,400' - Volume-19,000 C.Y.
27 PILOT BUTTE DAMS 1925-1926
RIVERTON PROJECT - WYOMING
Offstream
Rimrock Lake Storage-198,000 A.F. Max. W.S. El.2926.0'
Crest El.2935.0 Length-920'
El.2887.0
4' Rock from spillway dumped and barred to place
Sand, gravel, cobbles, and boulders compacted and graded by water jets
Puddled clay core
Sand, gravel, cobbles, and boulders compacted and graded by water jets
Rock fill (from spillway excav.) dumped loose
Reinforced concrete corewall extended not less than 10' into sound rock
Original ground surface
Earth and boulders
134' Maximum depth
Solid rock surface
Tieton River
Volume-2,049,000 C.Y.
24 TIETON DAM 1923-1925
YAKIMA PROJECT - WASHINGTON
Storage-680 A.F. W.S. El.4305'
Crest El.4309 Length-1300'
20 DEAVER DAM 1918
SHOSHONE PROJECT - WYOMING - MONTANA
Offstream
Volume-30,000 C.Y.
Axis of dike
24" Riprap - 12" Gravel
Crest El.2228.0 Length-9900'
Compacted earth material
18" Gravel
Max. W.S. El.2223'
El.2217
Original embankment constructed 1915
22 NELSON DIKES 1920
MILK RIVER PROJECT - MONTANA
Offstream
Storage-1,700,000 A.F. N.W.S. El.4354.5
El.4366.5
Length East - 1600'
West - 500'
El.4354.5
24" Hand placed rock paving
3' Hand placed rock paving
18" Gravel blanket
Reinforced concrete core wall
Dumped rock
Earth material rolled in 6" layers
Earth material rolled in 6" layers
Original ground surface
Sound rock surface
Drain
Grout holes
Snake River
Volume-313,600 C.Y.
25 AMERICAN FALLS DAM 1925-1927
CONCRETE-GRAVITY DAM WITH EARTHFILL ABUTMENTS
MINIDOKA PROJECT - IDAHO-WYOMING
40 0 40 80
SCALE OF FEET
4-22-63 REVISED
G. H.E.K.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1913 AND 1925
DRAWN W.G.H. SUBMITTED A. J. Peterka
TRACED W.A.P. RECOMMENDED J. W. Greene
CHECKED E.H.K. APPROVED Grant B. Woodward
ACTING CHIEF ENGR.
DENVER, COLORADO AUGUST 30, 1937
SHEET 2
103-D-579


ECHO DAM 1927-1931
WEBER RIVER PROJECT—UTAH
Weber River
MOON LAKE DAM 1935-1938
MOON LAKE PROJECT—UTAH
Duchesne River
ISLAND PARK DAM 1936-1938
MINIDOKA PROJECT—IDAHO-WYOMING
Henrys Fork
CLE ELUM DAM 1931-1933
YAKIMA PROJECT—WASHINGTON
Cle Elum River
PISHKUN DIKES 1930-1931
SUN RIVER PROJECT—MONTANA
Offstream
HYRUM DAM 1934-1935
HYRUM PROJECT—UTAH
Little Bear River
ALCOVA DAM 1935-1938
KENDRICK PROJECT—WYOMING
North Platte River
MIDVIEW DAM 1935-1937
MOON LAKE PROJECT—UTAH
Offstream
PINE VIEW DAM 1934-1936
OGDEN RIVER PROJECT—UTAH
Ogden River
AGENCY VALLEY DAM 1934-1935
VALE PROJECT—OREGON
Malheur River
ALAMOGORDO DAM 1936-1937
CARLSBAD PROJECT—NEW MEXICO
Pecos River
ANITA DAM 1936
HUNTLEY PROJECT—MONTANA
Offstream
RYE PATCH DAM 1935-1936
HUMBOLDT RIVER PROJECT—NEVADA
Humboldt River
BULL LAKE DAM 1936-1938
RIVERTON PROJECT—WYOMING
Bull Lake Creek
UNITY DAM 1936-1938
BURNT RIVER PROJECT—OREGON
Brunt River
TAYLOR PARK DAM 1935-1937
UNCOMPAHGRE PROJECT—COLORADO
Taylor River
CABALLO DAM 1936-1938
RIO GRANDE PROJECT—NEW MEXICO-TEXAS
Rio Grande River
SCALE OF FEET
For Pishku Dikes
Midview Dam
Anita Dam
SCALE OF FEET
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1927 AND 1936
DENVER, COLORADO, AUGUST 30, 1937
103-D-580


Storage-129,100 A.F.
N.W.S. El. 2575
24" Rock riprap on 12" gravel
M.W.S. El. 2591
Spillway Q=51,000 c.f.s.
12" Small rock fragments
Crest El. 2595, Length-2070'
Drain gutter
Blanket of earth material
Rock fill
Waste earth material
Slope-variable
Clay, silt, sand & gravel compacted to 6" layers
Waste
Grouted drains
Sand, silt and clay mixtures
12" Gravel under rockfill in river channel only
Volume- 2,105,000 C.Y.
46 FRESNO DAM 1937-1939
MILK RIVER PROJECT-MONTANA
Milk River
Storage-129,700 A.F.
N.W.S. El. 7685
Crest El. 7673 Length-4010'
3' Rock riprap
Rock and cobble fill
Clay, silt, sand, gravel & cobbles, compacted to 6" layers
Sand & gravel
Cofferdam
Abutments have conc. cutoff walls
Dense clay, sand, and gravel
18" Filter blanket
Pit run sand & gravel
Volume- 3,736,000 C.Y.
52 VALLECITO DAM 1938-1941
PINE RIVER PROJECT-COLORADO
Los Pinos River
9" Fine rock or gravel surfacing 3" Crown
Storage-4,600 A.F.
N.W.S. El. 5485.0
Crest El. 5493, Length-1,520
Note: The reservoir retained by the present dam covers the embankment constructed from 1898 through 1935.
24" Rock riprap
Clay and sand grading to gravel at outer slopes rolled to 6" layers
Gravel
Original ground surface
Variable
Stripping
Cutoff trench
Toe drain
Volume-136,000 C.Y.
50 FRUITGROWERS DAM 1938-1939
FRUITGROWERS DAM PROJECT-COLORADO
Alfalfa Run River
Storage-41,200 A.F.
N.W.S. El. 5605
Crest El. 5612, Length-1629'
Rock fill
Sand, gravel, silt & cobbles, compacted to 6" layers
Clay & gravel
Conc. cutoff walls
Tuff surface gravel
Silt, sand and tuff
Filter blanket
Volume-912,000 C.Y.
45 BOCA DAM 1937-1939
TRUCKEE STORAGE PROJECT-NEVADA-CALIFORNIA
Little Truckee River
Storage-187,300 A.F.
N.W.S. El. 4336
Crest El. 4347, Length-13,860'
Rock fill
Waste material
Sand & gravel
Cutoff trenches
Silt, clay and pumice
6' Rock fill
Volume - 1,852,000 C.Y.
54 WICKIUP DAM 1939-1942
DESCHUTES PROJECT-OREGON
Deschutes River
Storage-55,300 A.F.
N.W.S. 4445
Crest El. 4455, Length-285'
Clay, sand & gravel rolled to 6" layers
Original ground surface
Cutoff trench extended 24" into impervious stratum
6" Toe drain
Volume-30,000 C.Y.
53 CRANE PRAIRIE DAM 1939-1940
DESCHUTES PROJECT-OREGON
Deschutes River
Storage-15,400 A.F.
N.W.S. El. 7210
Crest El. 7218, Length-1170'
Sand and gravel
Silt, sand, gravel & cobbles compacted to 6" layers
Rock fill
Waste material
Conc cutoff walls
Rhyolite surface
Sand and gravel
Volume-539,000 C.Y.
47 GRASSY LAKE DAM 1937-1939
MINIDOKA PROJECT-IDAHO-WYOMING
Grassy Creek
Storage-493,200 A.F.
N.W.S. El. 4196
Crest El. 4206, Length-1350'
Clay, silt, sand and gravel compacted to 6" layers
Sluiced sand, gravel & cobbles placed in 12" layers
Silt, sand & gravel compacted to 6" layers
Fine sand
Gravel and boulders
Granite
Concrete cutoff walls
Volume-9,653,000 C.Y.
57 ANDERSON RANCH DAM 1941-1947
BOISE PROJECT-IDAHO-OREGON
Boise River
Storage-164,300 A.F.
N.W.S. El. 1559
Max. W.S. El. 1564
Crest El. 1571 Length-940'
6" Gravel surfacing
24" Rock fill
Silt, clay, sand & gravel rolled to 6" layers
Waste material
Sand
Clay or shale
Toe drain
18" Min. for water depths under 10', add 6" for each additional 10' depth
Volume-70,200 C.Y. (Includes Main Dam)
55 ALTUS RESERVOIR-NORTH DIKE, 1940-1942
W.C. AUSTIN PROJECT-OKLAHOMA
(Lugert and South Dikes similar)
Red River
Storage-49,000 A.F.
N.W.S. El. 714.0
Crest El. 750.0, Concrete length-2,700' Earth length-4,910'
3' Riprap
Clay, sand & gravel rolled to 6" layers
Rock fill
Sand and gravel
Stripping
Rock surface
Concrete cutoff walls
Drain Sand and gravel
Initial development
Volume-9,653,000 C.Y.
Enlargement volume - 1,635,900 C.Y.
Original volume- 87,700 C.Y.
48 MARSHALL FORD DIKE 1937-1942
COLORADO RIVER PROJECT-TEXAS
Constructed in conjunction with the concrete Marshall Ford Dam
Colorado River - Texas
SCALE OF FEET
Storage-152,600 A.F.
N.W.S. El. 5417
Crest El. 5425, Length-1304'
3' Rock riprap
Sand and gravel with some fines
Clay, silt, sand & gravel compacted to 6" layers
Blanket
Sand and gravel
Silty clay
Sand and gravel
Limestone boulders and clay
Conc cutoff wall
Limestone
Rock fill
Sand, gravel, cobbles and boulders from foundation excavation
Clay, silt, sand & gravel compacted to 6" layers
Trench for removal of clay layer, depth variable
Volume- 2,810,000 C.Y.
Provo River
49 DEER CREEK DAM 1938-1941
PROVO RIVER PROJECT-UTAH
Storage-154,600 A.F.
N.W.S. El. 7950
Crest El. 7960, Length-1150'
3' Rock riprap
Clay, silt, sand, gravel & cobbles compacted to 6" layers
Clay, sand, gravel, cobbles and rock
Cobble and rock fill
Conc. cutoff walls
Cofferdam
Waste
Bedrock surface
10' Filter blanket, Sluiced cobble and rock fill
Grouted paving
Sand and gravel
Blue River
Volume - 4,380,000 C.Y.
51 GREEN MOUNTAIN DAM 1938-1943
COLORADO-BIG THOMPSON PROJECT-COLORADO
For Fruitgrowers Dam
Crane Prairie Dam
Willow Creek Dam
Altus Dike
8-22-63 D-WEX REVISED
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1937 AND 1941
DRAWN H.W.S. SUBMITTED
TRACED J.E.V. RECOMMENDED
CHECKED E.E.F. APPROVED
DENVER, COLORADO, AUGUST 30, 1963
SHEET 4
103-D-581


Lake Mahave
Storage - 1,818,300 A.F.
3' Riprap
N.W.S. El. 647.0
El. 645.0
Crest El. 655.0
Length - 1,600
8'(+4') Material
Cofferdam
El. 575.0
Rock fill
Rock screenings
Silty sand & gravel rolled in 6" layers
Rock screenings
Rock fill
El. 580.0
El. 540.0
Waste
11'(+4') Material
Clay, sand & gravel from structural excavation
6' Rock fines
El. 458.0
Original ground surface
Sand & gravel from structural excavation
Volume - 3,642,000 C.Y.
Colorado River
59 DAVIS DAM 1942-1950
PARKER-DAVIS PROJECT - ARIZONA-NEVADA
Storage - 1,800 A.F.
Max. W.S. El. 1501.21
24" Riprap
12" Tunnel muck
Crest El. 1506.0
Length - 9600'
10' Hor. impervious material
El. variable
Stripping waste
Sand from reservoir excavation
Reservoir blanket of 12" impervious soil covered with 4" of sand
Volume - unavailable
San Diego Aqueduct
64 SAN JACINTO REGULATING RESERVOIR - 1945
SAN DIEGO AQUEDUCT PROJECT - CALIFORNIA
Storage - 31,100 A.F.
Max. W.S. El. 4016
N.W.S. El. 4007
3' Riprap on 12" Gravel
El. 3970
El. 3985
Crest El. 4024
Length - 5,508'
Coarse gravel or 24" rock blanket
Sand & gravel
16' Roadway
El. 3979
Waste
Rolled clay, sand & gravel
Rolled clay, sand & gravel from structural excav.
El. 3962
Original ground surface
Slopes 1:1 or flatter
25' Max.
18' Min.
Sand and gravel
30'±
Soft sandstone
Drains grouted full after filling cutoff trench
60' Max.
Toe drain embedded in screened gravel
Volume - 1,422,000 C.Y.
Niobrara River
58 BOX BUTTE DAM 1941-1946
MIRAGE FLATS PROJECT - NEBRASKA
Storage - 15,700 A.F.
Sand & gravel
N.W.S. El. 5908.0
Crest El. 5920.0
Length - 825'
Clay, sand, & gravel
Rock fill
3' Riprap
Clay, sand, & gravel rolled to 6" layers
El. 5835.0
El. 5830
El. 5810.0
24" Stripping
Concrete cutoff wall
100'
Earth material from cutoff trench
Drain
Volume - 607,000 C.Y.
Castle Creek
60 DEERFIELD DAM 1942-1947
RAPID VALLEY PROJECT - SOUTH DAKOTA
CASTLE CREEK
Storage - 18,400 A.F.
Max. W.S. El. 8367.0
El. 8360.00
3' Riprap
Crest El. 8375.0
Length - 5077'
Cobble and rock fill
El. 8347.00
7.66:1
El. 8335.00
Clay, sand & gravel rolled to 6" layers
Original ground surface
Sluiced sand & gravel
Sluiced sand & gravel
15'
Volume - 167,000 C.Y.
63 SHADOW MOUNTAIN DAM 1943-1946
COLORADO-BIG THOMPSON PROJECT - COLORADO
Storage - 900 A.F.
Max Emergency W.S. El. 8045
Max operating W.S. El. 8035
24" Riprap on 6" Gravel
Crest El. 8050
Length - 1770'
Clay, sand and gravel
Concrete cutoff wall
Offstream
Volume - 90,000 C.Y.
69 MARYS LAKE DIKES 1947-1948
COLORADO-BIG THOMPSON PROJECT - COLORADO
Storage - 5,600 A.F.
Masonry parapet
N.W.S. El. 4774.5
Crest El. 4781
Length - 3,340
3' Riprap
Rock fill
Clay, sand & gravel
El. 4725
El. 4730
El. 4710
Cofferdam
Sand & gravel
Sand & gravel
Drain
Volume - 410,000 C.Y.
Clarkston Creek
61 NEWTON DAM 1942-1946
NEWTON PROJECT - UTAH
Colorado River
Masonry parapet
Storage - 73,600 A.F.
N.W.S. El. 7617.50
El. 7617.5
Crest El. 7636.00
Length - 575'
3' Riprap
El. 7584.00
Clay, sand and gravel compacted to 6" layers
Rock fill
Uncompacted waste
24" Stripping
Concrete cutoff wall
Drain
Reservoir formed by present dam covers embankment built in 1925-1926
Shale and sandstone surface
Price River
Volume - 204,000 C.Y.
62 SCOFIELD DAM 1943-1946
SCOFIELD PROJECT - UTAH
Storage - 539,800 A.F.
N.W.S. El. 8280.0
Crest El. 8290, Length - 861' (Dam)
El. 8250
3' Rock riprap
El. 8180
Clay, silt, sand, gravel, and cobbles rolled to 6" layers
Sand, gravel, cobbles & rock sluiced in 18" layers
Cobble and Rock fill
El. 8122.00
Waste
El. 8125.00
El. 8075
Stripping
Sand, gravel and cobbles from foundation excavation
Sections for Granby Dikes No. 1, 2, 3, and 4 are similar
100 0 100 200
SCALE OF FEET
20'
125'
20'
125'
Concrete cutoff walls
Colorado River
For Davis Dam, Deerfield Dam, Newton Dam, Granby Dam
Volume - 2,974,000 C.Y. (Dam)
67 GRANBY DAM 1946-1948
COLORADO-BIG THOMPSON PROJECT - COLORADO
Storage - 703,200 A.F.
N.W.S. El. 4828.0
Crest El. 4840.00
Length - 785'
3' Riprap
El. 4785.0
Semi-pervious clay, sand & gravel rolled to 6" layers
Clay, sand and gravel rolled to 6" layers
Rock fill
Semi-pervious clay, sand & gravel rolled to 6" layers
Original ground surface
Surface of solid rock
50' Max.
15' Min.
50' Max.
Stripping
Concrete cutoff wall
Payette River
Volume - 395,000 C.Y.
66 CASCADE DAM 1946-1948
BOISE PROJECT - IDAHO - OREGON
40 0 40 80
SCALE OF FEET
Storage - 160,000 A.F.
Max. W.S. El. 3198.1
N.W.S. El. 3187.2
Crest El. 3207
Length - 1060' (Earth) - 970' (Concrete)
4' Riprap
12" Rock fines
Pit run sand & gravel rolled in 12" layers
Clay, sand & gravel compacted to 6" layers
Pit run sand & gravel rolled in 12" layers
Rock fill
Toe drain
Stripping
Original ground surface
Rock surface
Grout cap
Cheyenne River
Volume - 576,000 C.Y. (Earth only)
65 ANGOSTURA DAM 1946-1949
ANGOSTURA UNIT - MISSOURI RIVER BASIN PROJECT - SOUTH DAKOTA
Constructed in conjunction with the concrete Angostura Dam
Storage - 260 A.F.
6" Gravel surface
W.S. El. 66
Crest El. 72.0
Length - 1200'
12" Rock on 6" of gravel
El. 50'
El. 40
Sand filter
Clay, silt & sand
Stripping
Sand-filled drain holes 10"ø dia. @ 10'c's. both ways
Drain
Sandstone
Offstream
Volume - 195,000 C.Y.
68 MARTINEZ DAM 1946-1947
CENTRAL VALLEY PROJECT - CALIFORNIA
(Formerly Mountain View Dam)
Note: Additional dams started in 1946 shown on sheet 6
A-22-63 D-N.E.K.
REVISED
UNITED STATES
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BUREAU OF RECLAMATION
EARTH-FILL DAMS
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STARTED BETWEEN 1941 AND 1947
DRAWN H.W.C.
SUBMITTED
TRACED E.C.B.
RECOMMENDED
CHECKED E.E.E. E.C.
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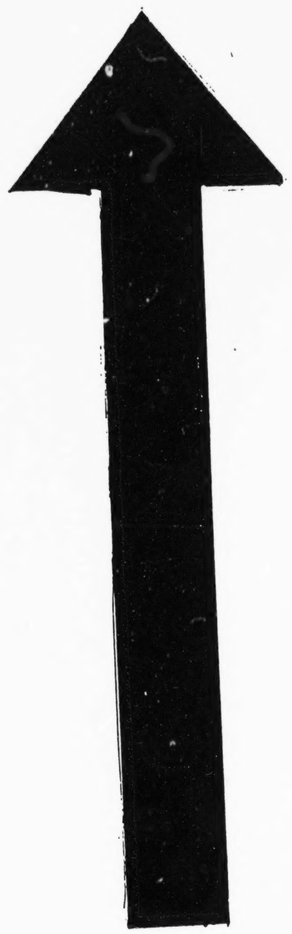
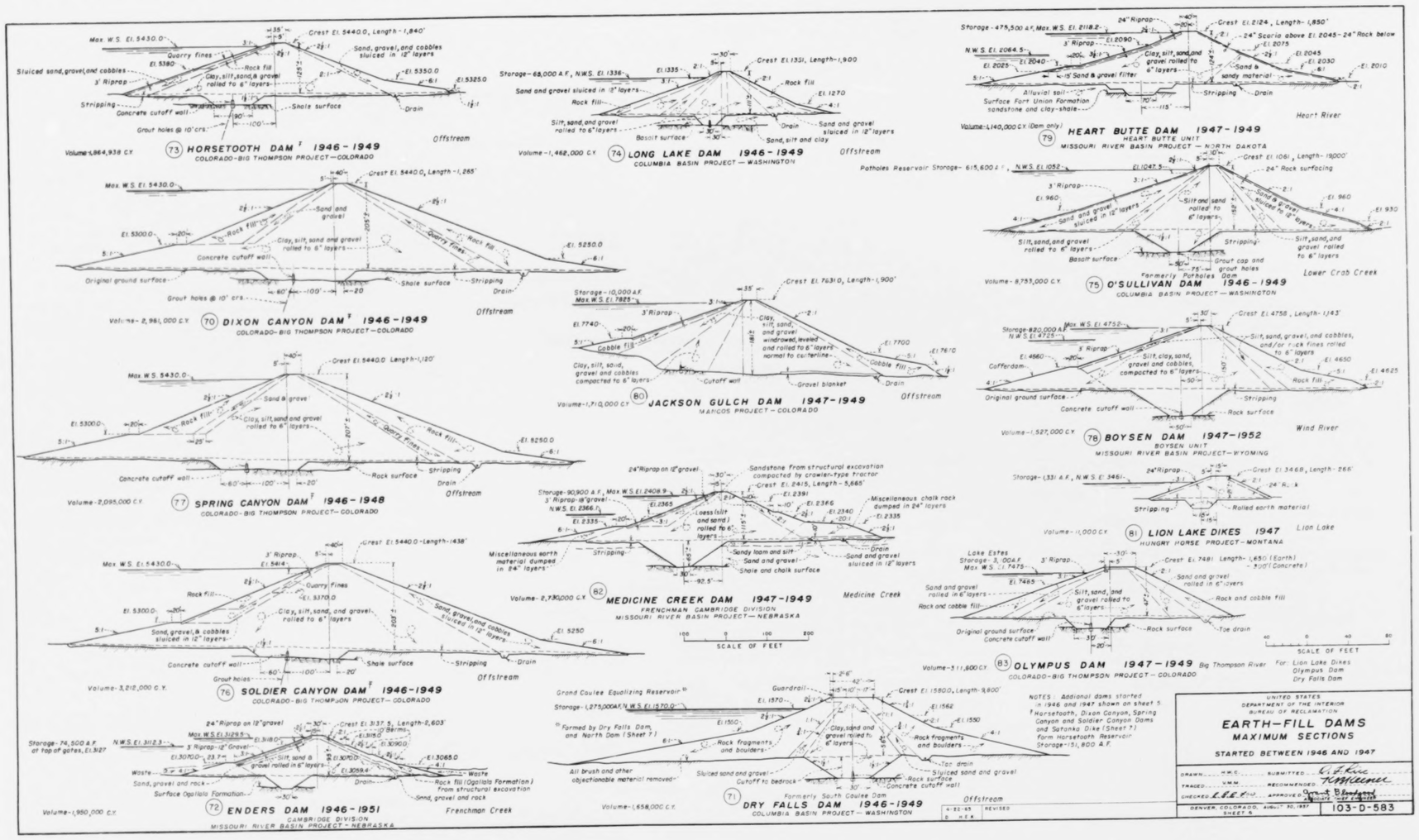
DENVER, COLORADO, AUGUST 30, 1957
SHEET 5
103-D-582




Max. W.S. El. 5430.0
Crest El. 5440.0, Length - 1,840'
Quarry fines
El. 5380
Rock fill
Sand, gravel, and cobbles sluiced in 12" layers
El. 5350.0
El. 5325.0
Sluiced sand, gravel, and cobbles
3' Riprap
Clay, silt, sand, & gravel rolled to 6" layers
Stripping
Concrete cutoff wall
Shale surface
Drain
Grout holes @ 10' crs.
Offstream
Volume - 1,864,938 C.Y.
73 HORSETOOTH DAM † 1946 - 1949
COLORADO - BIG THOMPSON PROJECT — COLORADO
Storage - 68,000 A.F., N.W.S. El. 1336
El. 1335
Crest El. 1331, Length - 1,900
Sand and gravel sluiced in 12" layers
Rock fill
El. 1270
Silt, sand, and gravel rolled to 6" layers
Basalt surface
Sand, silt and clay
Sand and gravel sluiced in 12" layers
Volume - 1,462,000 C.Y.
74 LONG LAKE DAM 1946 - 1949
COLUMBIA BASIN PROJECT — WASHINGTON
Offstream
Storage - 475,500 A.F., Max. W.S. El. 2118.2
24" Riprap
Crest El. 2124, Length - 1,850'
24" Scoria above El. 2045 - 24" Rock below
N.W.S. El. 2064.5
3' Riprap
El. 2090
El. 2075
El. 2045
El. 2040
El. 2030
El. 2025
El. 2010
Clay, silt, sand, and gravel rolled to 6" layers
Sand & gravel filter
Sand & sandy material
Alluvial soil
Surface Fort Union Formation sandstone and clay-shale
Stripping
Drain
Heart River
Volume - 1,140,000 C.Y. (Dam only)
79 HEART BUTTE DAM 1947 - 1949
HEART BUTTE UNIT
MISSOURI RIVER BASIN PROJECT — NORTH DAKOTA
Potholes Reservoir Storage - 615,600 A.F.
N.W.S. El. 1052
El. 1047.5
Crest El. 1061, Length - 19,000'
24" Rock surfacing
El. 960
El. 930
Sand and gravel sluiced in 12" layers
Silt and sand rolled to 6" layers
Silt, sand, and gravel rolled to 6" layers
Basalt surface
Grout cap and grout holes
Formerly Potholes Dam
Lower Crab Creek
Volume - 8,783,000 C.Y.
75 O'SULLIVAN DAM 1946 - 1949
COLUMBIA BASIN PROJECT — WASHINGTON
Max. W.S. El. 5430.0
Crest El. 5440.0, Length - 1,265'
Sand and gravel
Rock fill
El. 5300.0
Clay, silt, sand and gravel rolled to 6" layers
Quarry fines
El. 5250.0
Concrete cutoff wall
Original ground surface
Shale surface
Stripping
Drain
Grout holes @ 10' crs.
Offstream
Volume - 2,981,000 C.Y.
70 DIXON CANYON DAM † 1946 - 1949
COLORADO - BIG THOMPSON PROJECT — COLORADO
Storage - 10,000 A.F.
Max. W.S. El. 7825
Crest El. 7631.0, Length - 1,900'
3' Riprap
El. 7740
El. 7700
El. 7610
Clay, silt, sand, and gravel windrowed, leveled and rolled to 6" layers normal to centerline
Cobble fill
Clay, silt, sand, gravel and cobbles compacted to 6" layers
Cutoff wall
Gravel blanket
Drain
Offstream
Volume - 1,710,000 C.Y.
80 JACKSON GULCH DAM 1947 - 1949
MANCOS PROJECT — COLORADO
Storage - 820,000 A.F.
Max. W.S. El. 4758
N.W.S. El. 4725
Crest El. 4758, Length - 1,143'
Silt, sand, gravel, and cobbles, and/or rock fines rolled to 6" layers
Silt, clay, sand, gravel and cobbles compacted to 6" layers
El. 4660
El. 4650
El. 4625
Cofferdam
Rock fill
Original ground surface
Concrete cutoff wall
Stripping
Rock surface
Wind River
Volume - 1,527,000 C.Y.
78 BOYSEN DAM 1947 - 1952
BOYSEN UNIT
MISSOURI RIVER BASIN PROJECT — WYOMING
Max. W.S. El. 5430.0
Crest El. 5440.0 Length - 1,120'
Sand & gravel
Rock fill
El. 5300.0
Clay, silt, sand and gravel rolled to 6" layers
Quarry Fines
El. 5250.0
Concrete cutoff wall
Rock surface
Stripping
Drain
Offstream
Volume - 2,095,000 C.Y.
77 SPRING CANYON DAM † 1946 - 1948
COLORADO - BIG THOMPSON PROJECT — COLORADO
Storage - 90,900 A.F., Max. W.S. El. 2408.9
3' Riprap - 18" gravel
N.W.S. El. 2366.1
Sandstone from structural excavation compacted by crawler-type tractor
Crest El. 2415, Length - 5,665'
El. 2391
El. 2365
El. 2346
El. 2340
El. 2335
Loess (silt and sand) rolled to 6" layers
Miscellaneous chalk rock dumped in 24" layers
Stripping
Sandy loam and silt
Sand and gravel
Shale and chalk surface
Drain
Sand and gravel sluiced in 12" layers
Miscellaneous earth material dumped in 24" layers
Volume - 2,730,000 C.Y.
82 MEDICINE CREEK DAM 1947 - 1949
FRENCHMAN CAMBRIDGE DIVISION
MISSOURI RIVER BASIN PROJECT — NEBRASKA
Medicine Creek
Storage - 1,331 A.F., N.W.S. El. 3461
24" Riprap
Crest El. 3468, Length - 266'
24" Rock
Stripping
Rolled earth material
Volume - 11,000 C.Y.
81 LION LAKE DIKES 1947
HUNGRY HORSE PROJECT — MONTANA
Lion Lake
Max. W.S. El. 5430.0
Crest El. 5440.0 - Length - 1438'
3' Riprap
El. 5414
Quarry Fines
Rock fill
El. 5370.0
El. 5300.0
Clay, silt, sand, and gravel rolled to 6" layers
Sand, gravel, and cobbles sluiced in 12" layers
El. 5250
Concrete cutoff wall
Shale surface
Stripping
Drain
Grout holes
Offstream
Volume - 3,212,000 C.Y.
76 SOLDIER CANYON DAM † 1946 - 1949
COLORADO - BIG THOMPSON PROJECT — COLORADO
Lake Estes
Storage - 3,004 A.F.
Max. W.S. El. 7475
El. 7485
3' Riprap
Crest El. 7481 Length - 1,650 (Earth) - 900 (Concrete)
Sand and gravel rolled in 6" layers
Silt, sand, and gravel rolled to 6" layers
Rock and cobble fill
Original ground surface
Concrete cutoff wall
Rock surface
Toe drain
Big Thompson River
For: Lion Lake Dikes, Olympus Dam, Dry Falls Dam
Volume - 311,800 C.Y.
83 OLYMPUS DAM 1947 - 1949
COLORADO - BIG THOMPSON PROJECT — COLORADO
24" Riprap on 12" gravel
Max. W.S. El. 3129.5
Crest El. 3137.5, Length - 2,603'
10' Berms
Storage - 74,500 A.F. at top of gates, El. 3127
N.W.S. El. 3112.3
3' Riprap - 12" Gravel
El. 3118.0
El. 3115.0
El. 3109.0
El. 3070.0
El. 3065.0
Silt, sand & gravel rolled in 6" layers
Waste
Sand, gravel and rock
Surface Ogallala Formation
Drain
Rock fill (Ogallala Formation) from structural excavation
Sand, gravel and rock
Frenchman Creek
Volume - 1,950,000 C.Y.
72 ENDERS DAM 1946 - 1951
CAMBRIDGE DIVISION
MISSOURI RIVER BASIN PROJECT - NEBRASKA
Grand Coulee Equalizing Reservoir
Storage - (275,000 A.F.) N.W.S. El. 1570.0
Guardrail
El. 1570
Crest El. 1580.0, Length - 9,800'
El. 1562
El. 1550
Clay, sand and gravel rolled to 6" layers
Rock fragments and boulders
Taz drain
All brush and other objectionable material removed
Sluiced sand and gravel
Cutoff to bedrock
Concrete cutoff wall
Rock surface
Formerly South Coulee Dam
Offstream
Volume - 1,658,000 C.Y.
71 DRY FALLS DAM 1946 - 1949
COLUMBIA BASIN PROJECT — WASHINGTON
SCALE OF FEET
SCALE OF FEET
NOTES: Addional dams started in 1946 and 1947 shown on sheet 5.
† Horsetooth, Dixon Canyon, Spring Canyon and Soldier Canyon Dams and Satanka Dike (Sheet 7) form Horsetooth Reservoir. Storage - 151,800 A.F.
UNITED STATES
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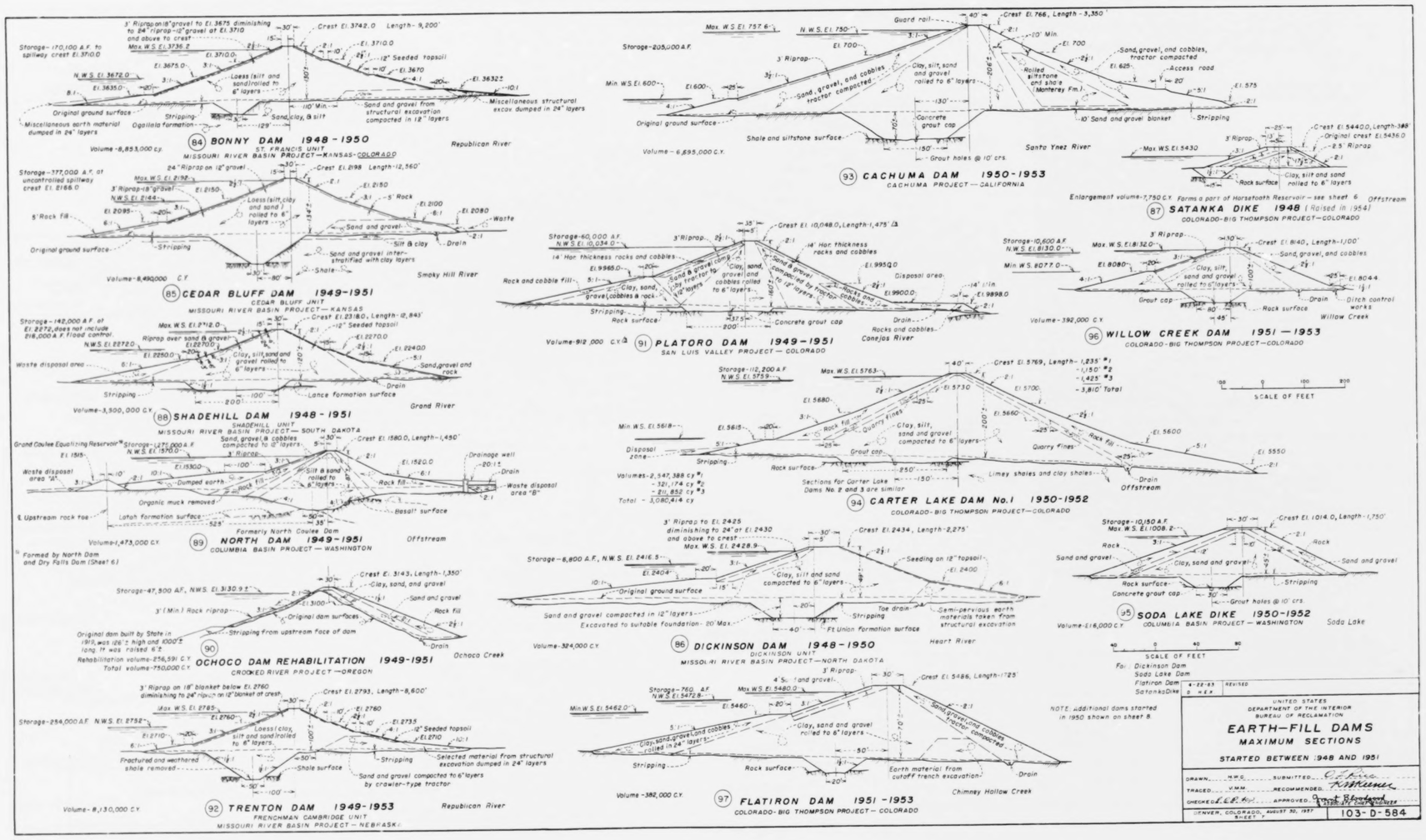
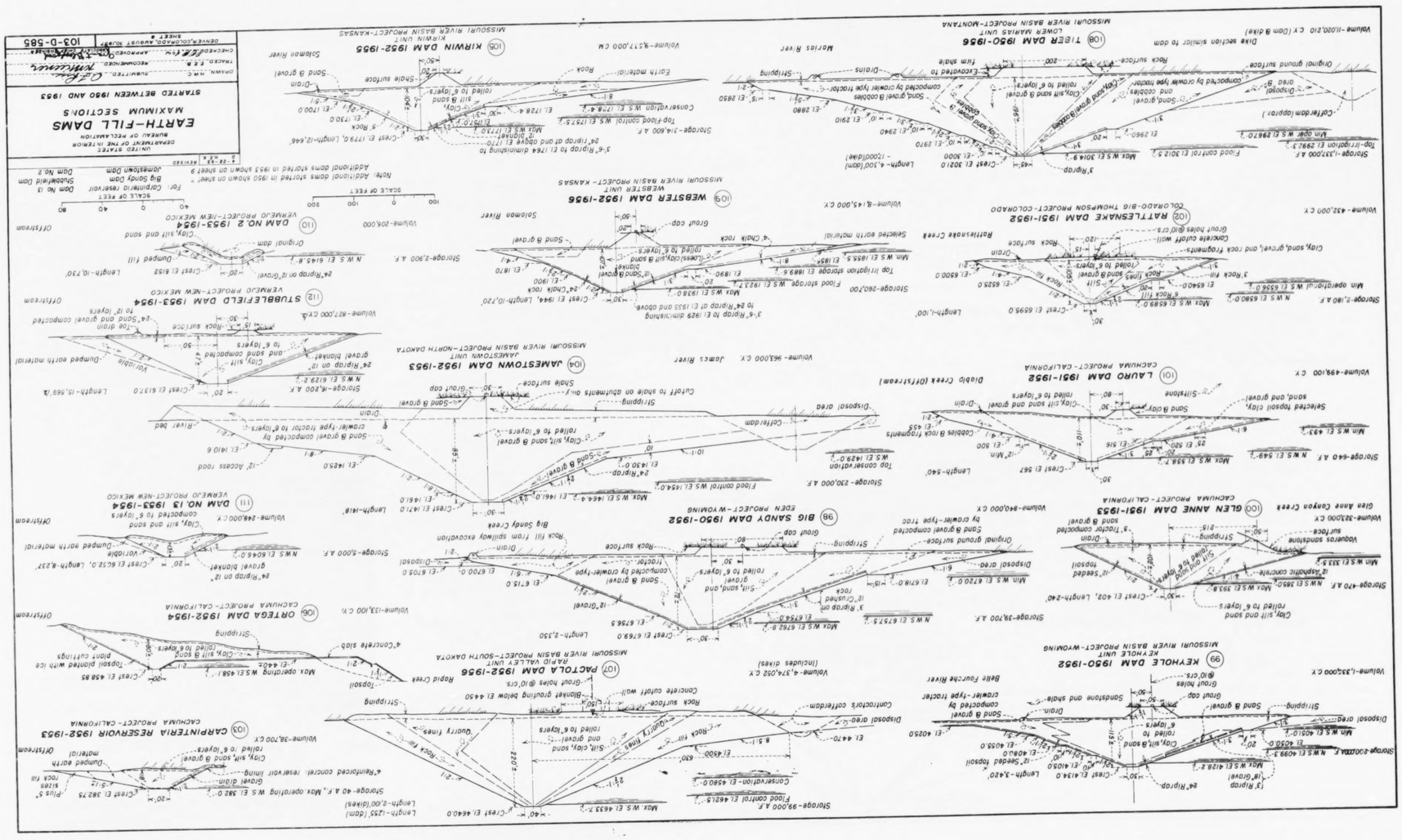
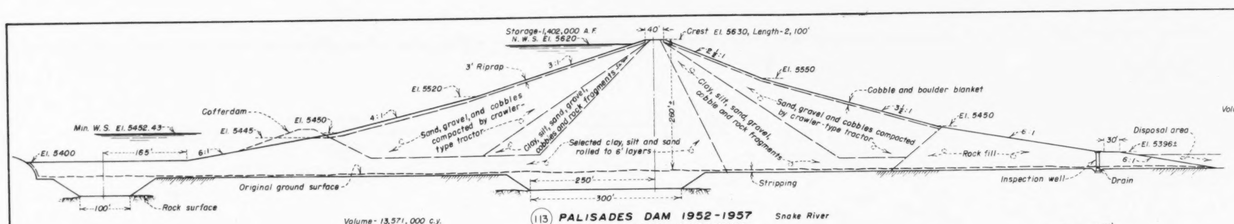
4-22-65 REVISED
D - N.S.

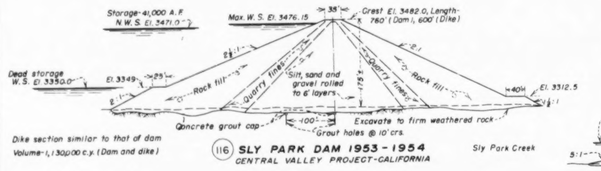

(84) BONNY DAM 1948-1950
S.T. FRANCIS UNIT
MISSOURI RIVER BASIN PROJECT—KANSAS-COLORADO
Republican River
(85) CEDAR BLUFF DAM 1949-1951
CEDAR BLUFF UNIT
MISSOURI RIVER BASIN PROJECT—KANSAS
Smoky Hill River
(88) SHADEHILL DAM 1948-1951
SHADEHILL UNIT
MISSOURI RIVER BASIN PROJECT—SOUTH DAKOTA
Grand River
(89) NORTH DAM 1949-1951
COLUMBIA BASIN PROJECT—WASHINGTON
Formerly North Coulee Dam
Offstream
(90) OCHOCO DAM REHABILITATION 1949-1951
CROOKED RIVER PROJECT—OREGON
Ochoco Creek
(92) TRENTON DAM 1949-1953
FRENCHMAN-CAMBRIDGE UNIT
MISSOURI RIVER BASIN PROJECT—NEBRASKA
Republican River
(91) PLATORO DAM 1949-1951
SAN LUIS VALLEY PROJECT—COLORADO
Conejos River
(93) CACHUMA DAM 1950-1953
CACHUMA PROJECT—CALIFORNIA
Santa Ynez River
(94) CARTER LAKE DAM No.1 1950-1952
COLORADO-BIG THOMPSON PROJECT—COLORADO
(86) DICKINSON DAM 1948-1950
DICKINSON UNIT
MISSOURI RIVER BASIN PROJECT—NORTH DAKOTA
Heart River
(97) FLATIRON DAM 1951-1953
COLORADO-BIG THOMPSON PROJECT—COLORADO
Chimney Hollow Creek
(87) SATANKA DIKE 1948 (Raised in 1954)
COLORADO-BIG THOMPSON PROJECT—COLORADO
Offstream
(96) WILLOW CREEK DAM 1951—1953
COLORADO-BIG THOMPSON PROJECT—COLORADO
Willow Creek
(95) SODA LAKE DIKE 1950-1952
COLUMBIA BASIN PROJECT—WASHINGTON
Soda Lake
SCALE OF FEET
For: Dickinson Dam
Soda Lake Dam
Flatiron Dam
Satanka Dike
4-22-53 REVISED
NOTE: Additional dams started in 1950 shown on sheet 8.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1948 AND 1951
DRAWN H.W.C. SUBMITTED
TRACED V.M.M. RECOMMENDED
CHECKED E.E.B. APPROVED
DENVER, COLORADO, AUGUST 30, 1957
SHEET 7
103-D-584


EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1930 AND 1953
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
103-D-585
SCALE OF FEET
Dam No 13
Shobberfield Dam
Dam No 2
Big Sandy Dam
Johnstown Dam
For: Comparative reservoir
Note: Additional dams started in 1950 shown on sheet 7
Additional dams started in 1953 shown on sheet 9
(112) STUBBLEFIELD DAM 1953-1954
VERMEJO PROJECT-NEW MEXICO
(110) DAM NO. 2 1953-1954
VERMEJO PROJECT-NEW MEXICO
(111) DAM NO. 13 1953-1954
VERMEJO PROJECT-NEW MEXICO
(106) ORTEGA DAM 1952-1954
CACHUMA PROJECT-CALIFORNIA
(103) CARPINTERIA RESERVOIR 1952-1953
CACHUMA PROJECT-CALIFORNIA
(104) JAMESTOWN DAM 1952-1953
JAMESTOWN UNIT
MISSOURI RIVER BASIN PROJECT-NORTH DAKOTA
(105) KIRWIN DAM 1952-1955
KIRWIN UNIT
MISSOURI RIVER BASIN PROJECT-KANSAS
(109) WEBSTER DAM 1952-1956
WEBSTER UNIT
MISSOURI RIVER BASIN PROJECT-KANSAS
(107) PACTOLA DAM 1952-1956
RAPID VALLEY UNIT
MISSOURI RIVER BASIN PROJECT-SOUTH DAKOTA
(98) BIG SANDY DAM 1950-1952
EDEN PROJECT-WYOMING
(99) KEYHOLE DAM 1950-1952
KEYHOLE UNIT
MISSOURI RIVER BASIN PROJECT-WYOMING
(100) GLEN ANNE DAM 1951-1953
CACHUMA PROJECT-CALIFORNIA
(101) LAURO DAM 1951-1952
CACHUMA PROJECT-CALIFORNIA
(102) RATTLESNAKE DAM 1951-1952
COLORADO-BIG THOMPSON PROJECT-COLORADO
(108) TIEBER DAM 1950-1956
LOWER MARIAS UNIT
MISSOURI RIVER BASIN PROJECT-MONTANA



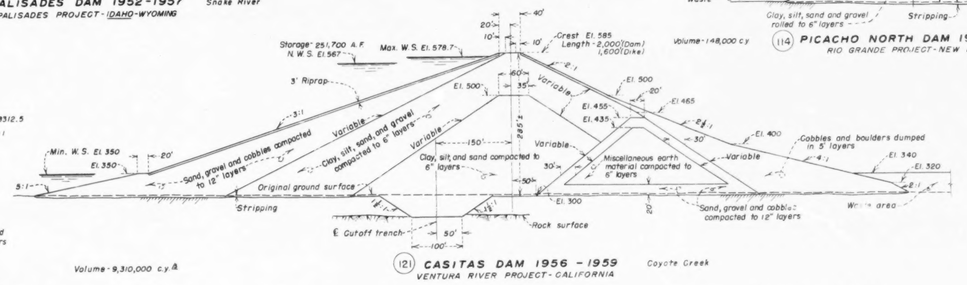
Volume-13,571,000 c.y.

(113) **PALISADES DAM 1952-1957** Snake River
PALISADES PROJECT-IDAHO-WYOMING

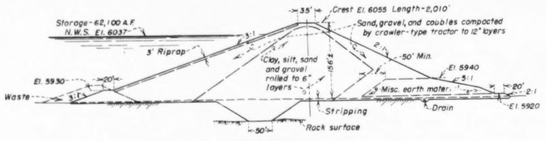


Dike section similar to that of dam
Volume-1,130,000 c.y. (Dam and dike)

(116) **SLY PARK DAM 1953-1954** Sly Park Creek
CENTRAL VALLEY PROJECT-CALIFORNIA



(121) **CASITAS DAM 1956-1959** Coyote Creek
VENTURA RIVER PROJECT-CALIFORNIA

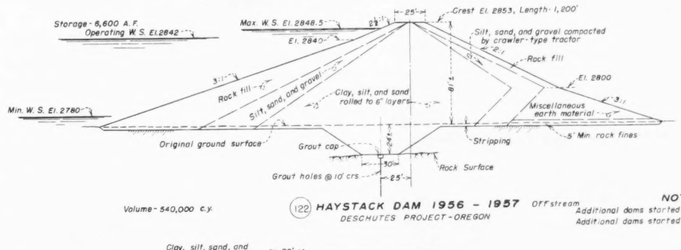


Volume-3,021,000 c.y.

(120) **WANSHIP DAM 1954-1957** Weber River
WEBER BASIN PROJECT-UTAH

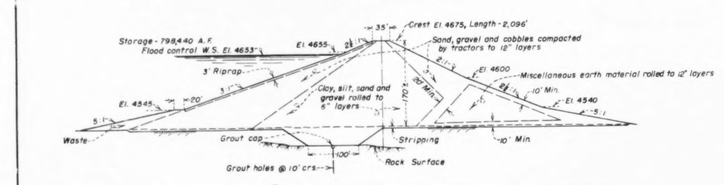
Volume-9,310,000 c.y.

100 0 100 200
SCALE OF FEET



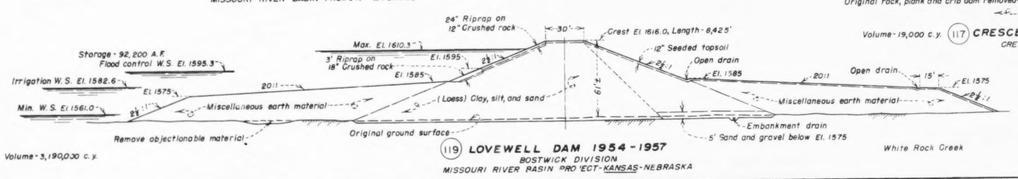
Volume-540,000 c.y.

(122) **HAYSTACK DAM 1956-1957** Offstream
DESCHUTES PROJECT-OREGON



Volume-2,896,000 c.y. (dam and dikes)

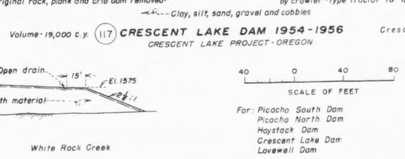
(118) **GLENDO DAM 1954-1957** North Platte River
GLENDO UNIT
MISSOURI RIVER BASIN PROJECT-WYOMING



Volume-3,190,000 c.y.

(119) **LOVEWELL DAM 1954-1957**
BOSTWICK DIVISION
MISSOURI RIVER BASIN PROJECT-KANSAS-NEBRASKA

White Rock Creek

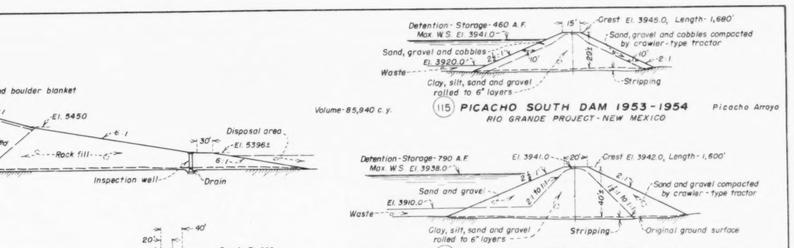

Clay, silt, sand, and gravel rolled to 6" layers
Crest El. 4860.0, Length-450'
El. 4854.0
Storage-86,000 A.F.
N.W.S. El. 4847.0
24" Riprap
Original rock, plank and crib dam removed
Silt, sand, gravel, cobbles, and boulders compacted by crawler-type tractor to 18" layers
Clay, silt, sand, gravel and cobbles

Volume-19,000 c.y.

(117) **CRESCENT LAKE DAM 1954-1956** Crescent Lake Outlet
CRESCENT LAKE PROJECT-OREGON

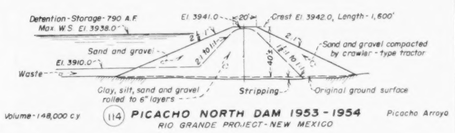
40 0 40 80
SCALE OF FEET

For: Picacho South Dam
Picacho North Dam
Haystack Dam
Crescent Lake Dam
Lovewell Dam



Volume-85,940 c.y.

(115) **PICACHO SOUTH DAM 1953-1954** Picacho Arroyo
RIO GRANDE PROJECT-NEW MEXICO



Volume-148,000 c.y.

(114) **PICACHO NORTH DAM 1953-1954** Picacho Arroyo
RIO GRANDE PROJECT-NEW MEXICO

NOTES
Additional dams started in 1953 shown on sheet 8
Additional dams started in 1956 shown on sheet 10

4-22-63 D H.E.K.	REVISED

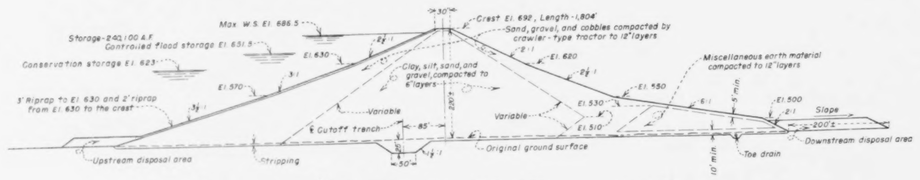
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

EARTH-FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1952 AND 1956

DRAWN H.K.S. SUBMITTED D. F. Price
TRACED H.R.W. RECOMMENDED J. B. Keener
CHECKED S.E.F. APPROVED Chief, Design and Construction Division

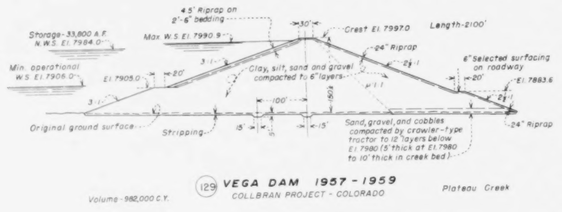
DENVER, COLORADO, AUGUST 30, 1957
SHEET 9

103-D-586



(125) **TWITCHELL DAM 1956 - 1958**
SANTA MARIA PROJECT - CALIFORNIA
(Formerly Vaquera Dam)

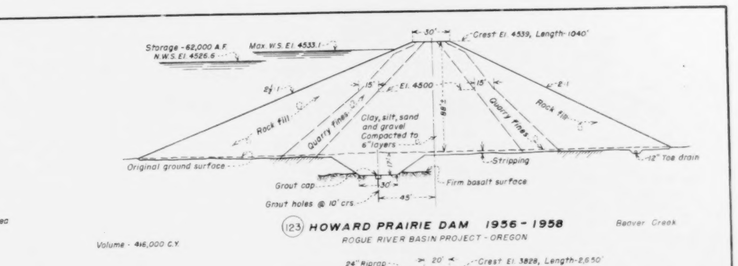
Guyama River


4.5' Riprap on 2'-6" bedding
Crest El. 7997.0
Length-2100'
Storage-33,800 A.F.
N.W.S. El. 7984.0
Max. W.S. El. 7990.9
24" Riprap
Min. operational W.S. El. 7906.0
El. 7905.0
Clay, silt, sand and gravel compacted to 6" layers
6" selected surfacing on roadway
El. 7883.6
Original ground surface
Stripping
Sand, gravel, and cobbles compacted by crawler-type tractor to 12" layers below El. 7980 (5' thick at El. 7980 to 10' thick in creek bed)
24" Riprap

(129) **VEGA DAM 1957 - 1959**
COLLBRAN PROJECT - COLORADO

Plateau Creek

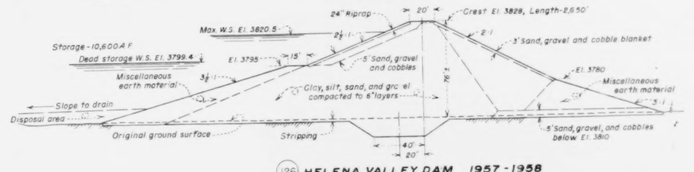
Volume-982,000 C.Y.



(123) **HOWARD PRAIRIE DAM 1956 - 1958**
ROGUE RIVER BASIN PROJECT - OREGON

Beaver Creek

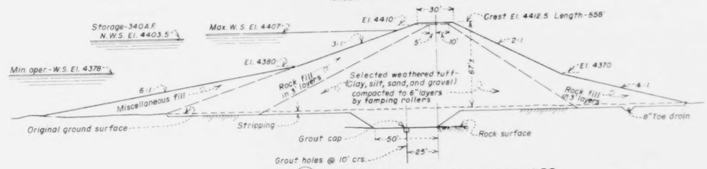
Volume - 416,000 C.Y.



(126) **HELENA VALLEY DAM 1957 - 1958**
HELENA VALLEY UNIT
MISSOURI RIVER BASIN PROJECT - MONTANA

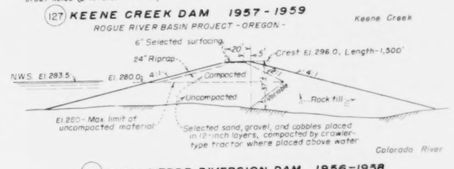
Offstream

Volume-304,000 C.Y.



(127) **KEENE CREEK DAM 1957 - 1959**
ROGUE RIVER BASIN PROJECT - OREGON

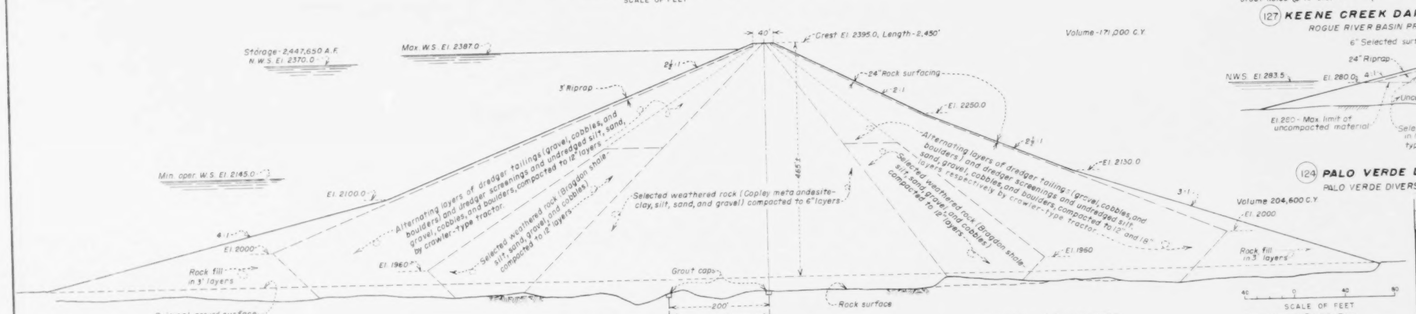
Keene Creek


6" Selected surfacing
24" Riprap
Crest El. 296.0, Length-1,500'
N.W.S. El. 283.5
El. 280.0
Compacted
Uncompacted
Rock fill
El. 280 - Max limit of uncompacted material
Selected sand, gravel, and cobbles placed in 12-inch layers, compacted by crawler-type tractor where placed above water

Colorado River

(124) **PALO VERDE DIVERSION DAM 1956-1958**
PALO VERDE DIVERSION PROJECT- ARIZONA- CALIFORNIA-

Volume 204,600 C.Y.


Storage-2,447,650 A.F.
N.W.S. El. 2370.0
Max. W.S. El. 2387.0
Crest El. 2395.0, Length-2,450'
Volume-171,200 C.Y.
3' Riprap
24" Rock surfacing
El. 2250.0
El. 2130.0
Min. oper. W.S. El. 2145.0
El. 2100.0
El. 2000
Alternating layers of dredger tailings (gravel, cobbles, and boulders) and dredger screenings and undredged silt, sand, gravel, cobbles, and boulders, compacted to 12" layers by crawler-type tractor
Selected weathered rock (Dragon shale, silt, sand, gravel, and cobbles) compacted to 6" layers
Selected weathered rock (Dragon shale, silt, sand, gravel, and cobbles) compacted to 6" layers, over 12" layers
Selected weathered rock (Dragon shale, silt, sand, gravel, and cobbles) compacted to 12" layers
Rock fill in 3' layers
El. 1960
Grout cap
200'
Grout holes @ 10' crs.
Rock surface
Original ground surface
Rock fill in 3' layers
Volume-28,986,000 C.Y.

(128) **TRINITY DAM 1957 - 1962**
CENTRAL VALLEY PROJECT - CALIFORNIA

Note: Additional dams started in 1956 shown on Sheet 9

Trinity River

SCALE OF FEET
For: Howard Prairie Dam
Helena Valley Dam
Keene Creek Dam
Palo Verde Diversion Dam

4-22-63 D - M.E.	REVISED
7-30-58 D - M.C.	ADDED PALO VERDE DIVERSION DAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

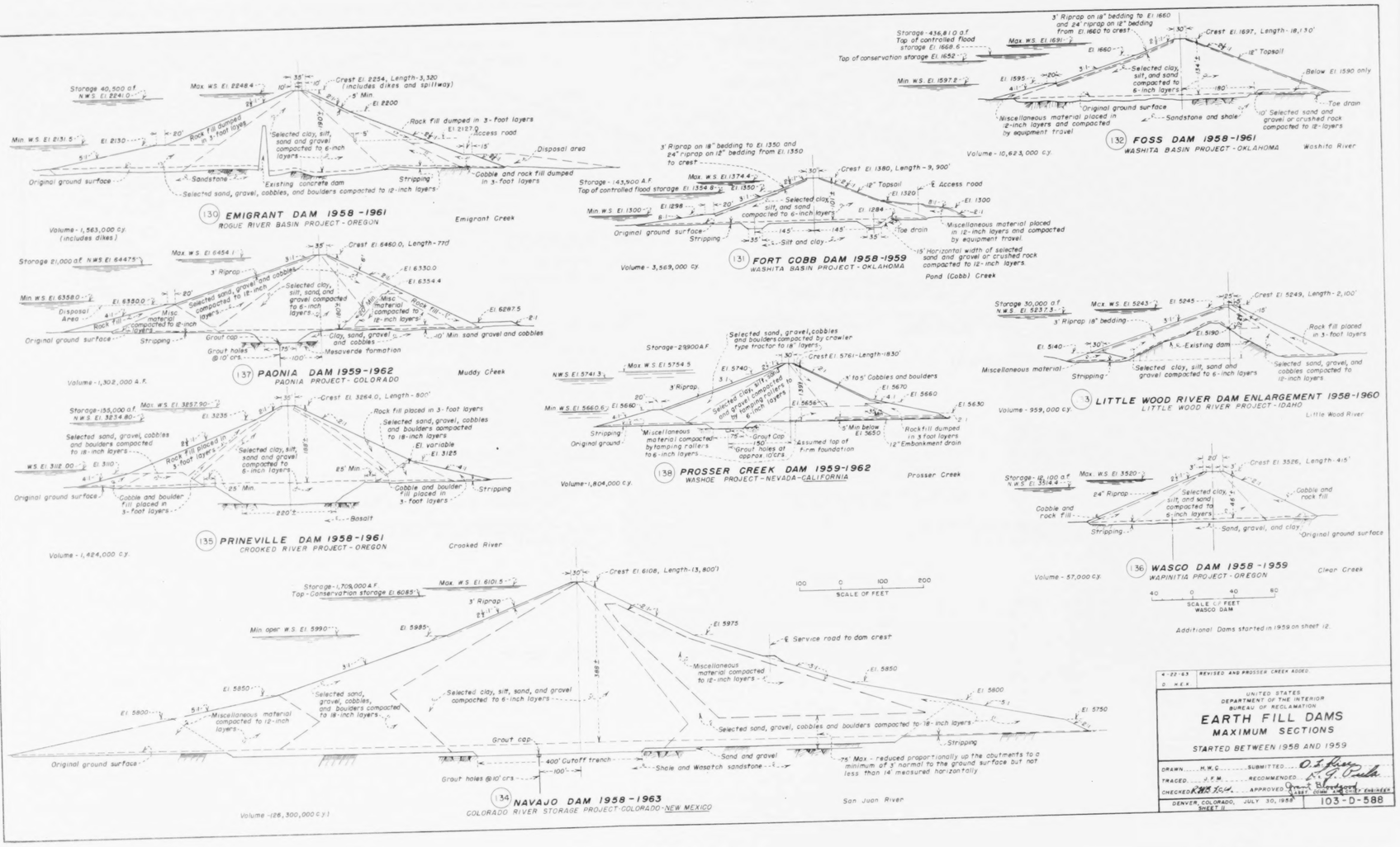
EARTH-FILL DAMS
MAXIMUM SECTIONS

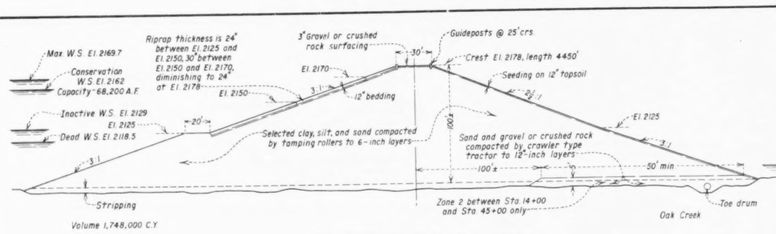
STARTED BETWEEN 1956 AND 1957

DRAWN H.W.G. SUBMITTED
TRACED E.M.W. RECOMMENDED
CHECKED P.C.L. APPROVED

DENVER, COLORADO, AUGUST 30, 1957
SHEET 10

103-D-587

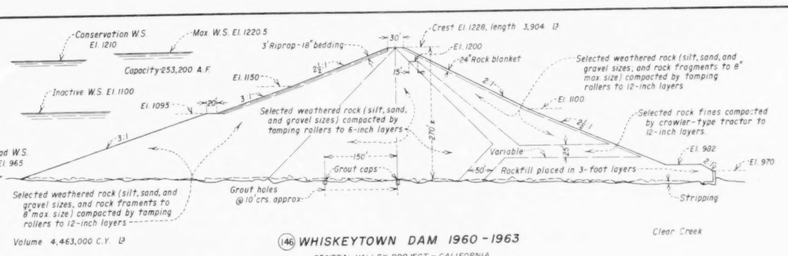

Storage 40,500 a.f.
N.W.S. El. 2241.0
Max. W.S. El. 2248.4
Crest El. 2254, Length-3,320 (includes dikes and spillway)
5' Min.
El. 2200
Rock fill dumped in 3- foot layers
El. 2127.9
Access road
Min. W.S. El. 2131.5
El. 2130
Rock fill dumped in 3- foot layers
Selected clay, silt, sand and gravel compacted to 6-inch layers
Disposal area
Original ground surface
Sandstone
Existing concrete dam
Stripping
Cobble and rock fill dumped in 3- foot layers
Selected sand, gravel, cobbles, and boulders compacted to 12-inch layers
130 EMIGRANT DAM 1958-1961
ROGUE RIVER BASIN PROJECT - OREGON
Emigrant Creek
Volume - 1,563,000 cy. (includes dikes)
Storage 21,000 a.f. N.W.S. El. 6447.5
Max. W.S. El. 6454.1
Crest El. 6460.0, Length-770
3' Riprap
El. 6330.0
El. 6354.4
Min. W.S. El. 6358.0
El. 6350.0
Disposal Area
Misc. material compacted to 12-inch layers
Selected sand, gravel and cobbles compacted to 12-inch layers
Selected clay, silt, sand, and gravel compacted to 6-inch layers
Misc. material compacted to 12-inch layers
Rock Fill
El. 6287.5
Original ground surface
Stripping
Grout cap
Grout holes @10' crs.
Clay, sand, gravel and cobbles
Mesaverde formation
10' Min. sand gravel and cobbles
137 PAONIA DAM 1959-1962
PAONIA PROJECT - COLORADO
Muddy Creek
Volume - 1,302,000 A.F.
Storage-155,000 a.f. N.W.S. El. 3234.80
Max. W.S. El. 3257.90
Crest El. 3264.0, Length - 800'
El. 3235
Rock fill placed in 3- foot layers
Selected sand, gravel, cobbles and boulders compacted to 18-inch layers
El. variable
El. 3125
W.S. El. 3112.00
El. 3110
Selected clay, silt, sand and gravel compacted to 6-inch layers
85' Min.
25' Min.
220'±
Original ground surface
Cobble and boulder fill placed in 3- foot layers
Cobble and boulder fill placed in 3- foot layers
Stripping
Basalt
135 PRINEVILLE DAM 1958-1961
CROOKED RIVER PROJECT - OREGON
Crooked River
Volume - 1,424,000 c.y.
Storage-1,709,000 A.F.
Top-Conservation storage El. 6085'
Max. W.S. El. 6101.5
Crest El. 6108, Length-13,800'
3' Riprap
Min. oper. W.S. El. 5990'
El. 5985'
El. 5975
℄ Service road to dam crest
Miscellaneous material compacted to 12-inch layers
El. 5850
El. 5800
El. 5750
Selected sand, gravel, cobbles, and boulders compacted to 18-inch layers
Selected clay, silt, sand, and gravel compacted to 6-inch layers
Miscellaneous material compacted to 12-inch layers
Grout cap
400' Cutoff trench
100'
Grout holes @ 10' crs.
Sand and gravel
Shale and Wasatch sandstone
Stripping
75' Max. - reduced proportionally up the abutments to a minimum of 3' normal to the ground surface but not less than 14' measured horizontally
Original ground surface
134 NAVAJO DAM 1958-1963
COLORADO RIVER STORAGE PROJECT-COLORADO-NEW MEXICO
San Juan River
Volume -126,300,000 c.y.
100 0 100 200
SCALE OF FEET
Storage - 436,810 a.f.
Top of controlled flood storage El. 1668.6
Top of conservation storage El. 1652
Max. W.S. El. 1691
3' Riprap on 18" bedding to El. 1660 and 24" riprap on 12" bedding from El. 1660 to crest
Crest El. 1697, Length- 18,130'
El. 1660
18" Topsoil
Min. W.S. El. 1597.2
El. 1595
Selected clay, silt, and sand compacted to 6-inch layers
Below El. 1590 only
Miscellaneous material placed in 12-inch layers and compacted by equipment travel
Original ground surface
Sandstone and shale
Toe drain
Selected sand and gravel or crushed rock compacted to 12- layers
132 FOSS DAM 1958-1961
WASHITA BASIN PROJECT - OKLAHOMA
Washita River
Volume - 10,623,000 cy.
Storage - 143,900 A.F.
Top of controlled flood storage El. 1354.8
3' Riprap on 18" bedding to El. 1350 and 24" riprap on 12" bedding from El. 1350 to crest
Max. W.S. El. 1374.4
Crest El. 1380, Length - 9, 900'
El. 1350
12" Topsoil
℄ Access road
El. 1320
El. 1300
Min. W.S. El. 1300
El. 1298
Selected clay, silt, and sand compacted to 6-inch layers
El. 1284
Original ground surface
Stripping
Toe drain
Miscellaneous material placed in 12-inch layers and compacted by equipment travel
145'
35'
Silt and clay
15' Horizontal width of selected sand and gravel or crushed rock compacted to 12- inch layers.
Pond (Cobb) Creek
131 FORT COBB DAM 1958-1959
WASHITA BASIN PROJECT - OKLAHOMA
Volume - 3,569,000 cy.
Storage-23,900A.F.
Selected sand, gravel, cobbles and boulders compacted by crawler type tractor to 18" layers
Max. W.S. El. 5754.5
Crest El. 5761-Length-1830'
N.W.S. El. 5741.3
El. 5740
3' Riprap
3' to 10.5' Cobbles and boulders
El. 5670
El. 5660
Min. W.S. El. 5660.6
El. 5660
Selected Clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
El. 5656
El. 5630
Stripping
Original ground
Miscellaneous material compacted by tamping rollers to 6-inch layers
75'
Grout Cap
150'
Grout holes at approx. 10 Crs.
Assumed top of firm foundation
5' Min. below El. 5650
Rockfill dumped in 3 foot layers
12" Embankment drain
138 PROSSER CREEK DAM 1959-1962
WASHOE PROJECT - NEVADA-CALIFORNIA
Prosser Creek
Volume-1,804,000 c.y.
Storage 30,000 a.f. N.W.S. El. 5237.3
Max. W.S. El. 5243
El. 5245
Crest El. 5249, Length- 2,100'
3' Riprap 18" bedding
El. 5190
Rock fill placed in 3- foot layers
El. 5140
Existing dam
Miscellaneous material
Stripping
Selected clay, silt, sand and gravel compacted to 6-inch layers
Selected sand, gravel, and cobbles compacted to 12-inch layers
3 LITTLE WOOD RIVER DAM ENLARGEMENT 1958-1960
LITTLE WOOD RIVER PROJECT - IDAHO
Little Wood River
Volume - 959,000 cy.
Storage-12,100 a.f. N.W.S. El. 3514.4
Max. W.S. El. 3520
Crest El. 3526, Length- 415'
24" Riprap
Selected clay, silt, and sand compacted to 6-inch layers
Cobble and rock fill
Cobble and rock Fill
Stripping
Sand, gravel, and clay
Original ground surface
36 WASCO DAM 1958-1959
WAPINITIA PROJECT - OREGON
Clear Creek
Volume - 57,000 c.y.
40 0 40 80
SCALE OF FEET
WASCO DAM
Additional Dams started in 1959 on sheet 12.
4-22-63 O.H.E.K. REVISED AND PROSSER CREEK ADDED.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
EARTH FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1958 AND 1959
DRAWN H.W.G. SUBMITTED O. I. Klaus
TRACED J.F.M. RECOMMENDED
CHECKED APPROVED
DENVER, COLORADO, JULY 30, 1958
SHEET 11
103-D-588


Max. W.S. El. 2169.7
Conservation W.S. El. 2162
Capacity 68,200 A.F.
Inactive W.S. El. 2129
Dead W.S. El. 2118.5
Riprap thickness is 24" between El. 2125 and El. 2150, 30" between El. 2150 and El. 2170, diminishing to 24" at El. 2178
3' Gravel or crushed rock surfacing
Guideposts @ 25' crs.
Crest El. 2178, length 4450'
Seeding on 12" topsoil
El. 2170
El. 2150
12" bedding
El. 2125
Selected clay, silt, and sand compacted by tamping rollers to 6-inch layers
Sand and gravel or crushed rock compacted by crawler type tractor to 12-inch layers
100' x
50' min
Stripping
Zone 2 between Sta. 14+00 and Sta. 45+00 only
Toe drum
Oak Creek

Volume 1,748,000 C.Y.

(14) SHERMAN DAM 1959 - 1962

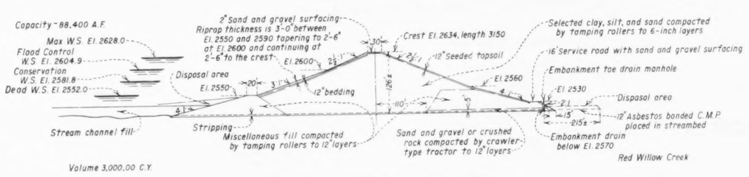
MISSOURI RIVER BASIN PROJECT - NEBRASKA


Conservation W.S. El. 1210
Max. W.S. El. 1220.5
Capacity 253,200 A.F.
Inactive W.S. El. 1100
El. 1095
El. 1150
3' Riprap - 18" bedding
Crest El. 1228, length 3,904'
El. 1200
24" Rock blanket
Selected weathered rock (silt, sand, and gravel sizes, and rock fragments to 8" max. size) compacted by tamping rollers to 12-inch layers
El. 1100
Selected weathered rock (silt, sand, and gravel sizes) compacted by tamping rollers to 6-inch layers
Selected rock fines compacted by crawler-type tractor to 12-inch layers
El. 982
El. 970
Variable
Grout caps
Rockfill placed in 3-foot layers
Grout holes @ 10' crs. approx.
Stripping
Dead W.S. El. 965
Selected weathered rock (silt, sand, and gravel sizes, and rock fragments to 8" max. size) compacted by tamping rollers to 12-inch layers
Clear Creek

Volume 4,463,000 C.Y.

(46) WHISKEYTOWN DAM 1960 - 1963

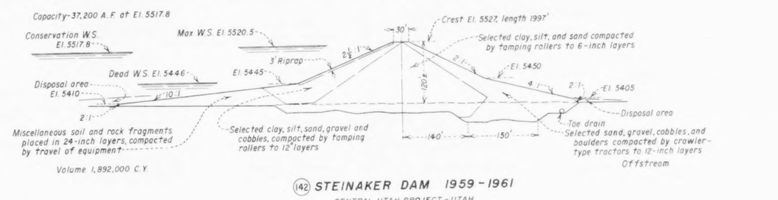
CENTRAL VALLEY PROJECT - CALIFORNIA


Capacity 88,400 A.F.
Max W.S. El. 2628.0
Flood Control W.S. El. 2604.9
Conservation W.S. El. 2581.8
Dead W.S. El. 2552.0
2' Sand and gravel surfacing
Riprap thickness is 3'-0" between El. 2550 and 2590 tapering to 2'-6" at El. 2600 and continuing at 2'-6" to the crest
Disposal area El. 2550
El. 2600
12" bedding
Crest El. 2634, length 3150'
12" Seedec topsoil
El. 2560
El. 2530
Selected clay, silt, and sand compacted by tamping rollers to 6-inch layers
16' Service road with sand and gravel surfacing
Embankment toe drain manhole
Disposal area
12" Asbestos bonded C.M.P. placed in streambed
Embankment drain below El. 2570
Stream channel fill
Stripping
Miscellaneous fill compacted by tamping rollers to 12" layers
Sand and gravel or crushed rock compacted by crawler-type tractor to 12" layers
Red Willow Creek

Volume 3,000,00 C.Y.

(44) RED WILLOW DAM 1960 - 1962

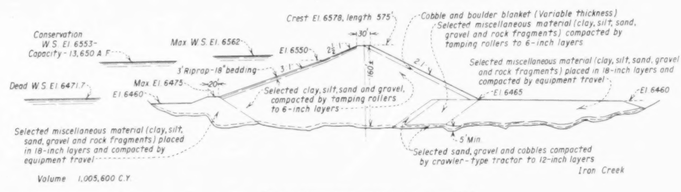
MISSOURI RIVER BASIN PROJECT - NEBRASKA


Capacity 37,200 A.F. at El. 5517.8
Conservation W.S. El. 5517.8
Max. W.S. El. 5520.5
Dead W.S. El. 5446
El. 5445
3' Riprap
Crest El. 5527, length 1997'
Selected clay, silt, and sand compacted by tamping rollers to 6-inch layers
El. 5450
El. 5405
Disposal area El. 5410
Miscellaneous soil and rock fragments placed in 24-inch layers, compacted by travel of equipment
Selected clay, silt, sand, gravel and cobbles, compacted by tamping rollers to 12" layers
Toe drain
Selected sand, gravel, cobbles, and boulders compacted by crawler-type tractors to 12-inch layers
Offstream

Volume 1,892,000 C.Y.

(42) STEINAKER DAM 1959 - 1961

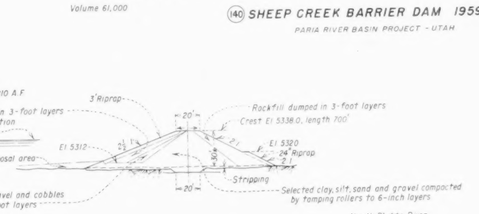
CENTRAL UTAH PROJECT - UTAH


Conservation W.S. El. 6553
Capacity 13,650 A.F.
Dead W.S. El. 6471.7
Max. W.S. El. 6562
El. 6550
5' Riprap - 18" bedding
Max. El. 6475
El. 6460
Crest El. 6578, length 575'
Cobble and boulder blanket (Variable thickness)
Selected miscellaneous material (clay, silt, sand, gravel and rock fragments) compacted by tamping rollers to 6-inch layers
Selected miscellaneous material (clay, silt, sand, gravel and rock fragments) placed in 18-inch layers and compacted by equipment travel
El. 6465
El. 6460
Selected clay, silt, sand and gravel, compacted by tamping rollers to 6-inch layers
5' Min
Selected sand, gravel and cobbles compacted by crawler-type tractor to 12-inch layers
Selected miscellaneous material (clay, silt, sand, gravel and rock fragments) placed in 18-inch layers and compacted by equipment travel
Iron Creek

Volume 1,005,600 C.Y.

(43) CRAWFORD DAM 1960 - 1962

SMITH FORK PROJECT - COLORADO


Capacity 1,810 A.F.
3' Riprap
Rockfill dumped in 3-foot layers
Max. and Conservation W.S. El. 5332.0
Dead W.S. El. 5312
El. 5312
Disposal area
Rockfill dumped in 3-foot layers
Crest El. 5338.0, length 700'
El. 5320
24" Riprap
Stripping
Selected sand, gravel and cobbles dumped in 3-foot layers
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
North Platte River

Volume 40,000 C.Y.

(39) GRAY REEF DAM 1959 - 1961

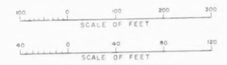
MISSOURI RIVER BASIN PROJECT - WYOMING

6' Road
Max. W.S. El. 5878
Dead W.S. El. 5867.0
Crest El. 5882 - length 600'
Selected sand, gravel and cobbles compacted by crawler-type tractor to 12-inch layers after all miscellaneous material has been utilized
Stripping
Miscellaneous material compacted by tamping rollers to 12-inch layers
5' Min
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Key trench above El. 5855 in abutment only
Selected sand, gravel and cobbles compacted by crawler-type tractor to 12-inch layers after all miscellaneous material has been utilized
Sheep Creek

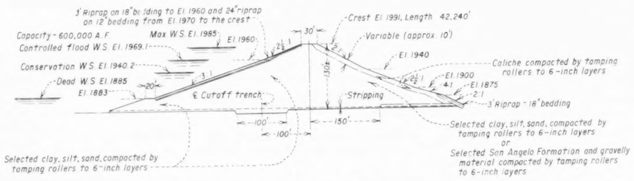
Volume 61,000

(40) SHEEP CREEK BARRIER DAM 1959-1960

PARIA RIVER BASIN PROJECT - UTAH



For Sheep Creek, Gray Reef and Sherman Dams


3' Riprap on 18" bedding to El. 1960 and 24" riprap on 12" bedding from El. 1970 to the crest
Capacity - 600,000 A.F.
Controlled flood W.S. El. 1969.1
Conservation W.S. El. 1940.2
Dead W.S. El. 1885
El. 1883
Max. W.S. El. 1985
El. 1960
Crest El. 1991, Length 42,240'
Variable (approx. 10)
El. 1940
El. 1900
El. 1875
Caliche compacted by tamping rollers to 6-inch layers
3' Riprap - 18" bedding
℄ Cutoff trench
Stripping
Selected clay, silt, sand, compacted by tamping rollers to 6-inch layers
or
Selected San Angelo Formation and gravelly material compacted by tamping rollers to 6-inch layers
Selected clay, silt, sand, compacted by tamping rollers to 6-inch layers
Concho and Spring Creek

Volume - 21,000,000

(45) TWIN BUTTES DAM 1960 - 1963

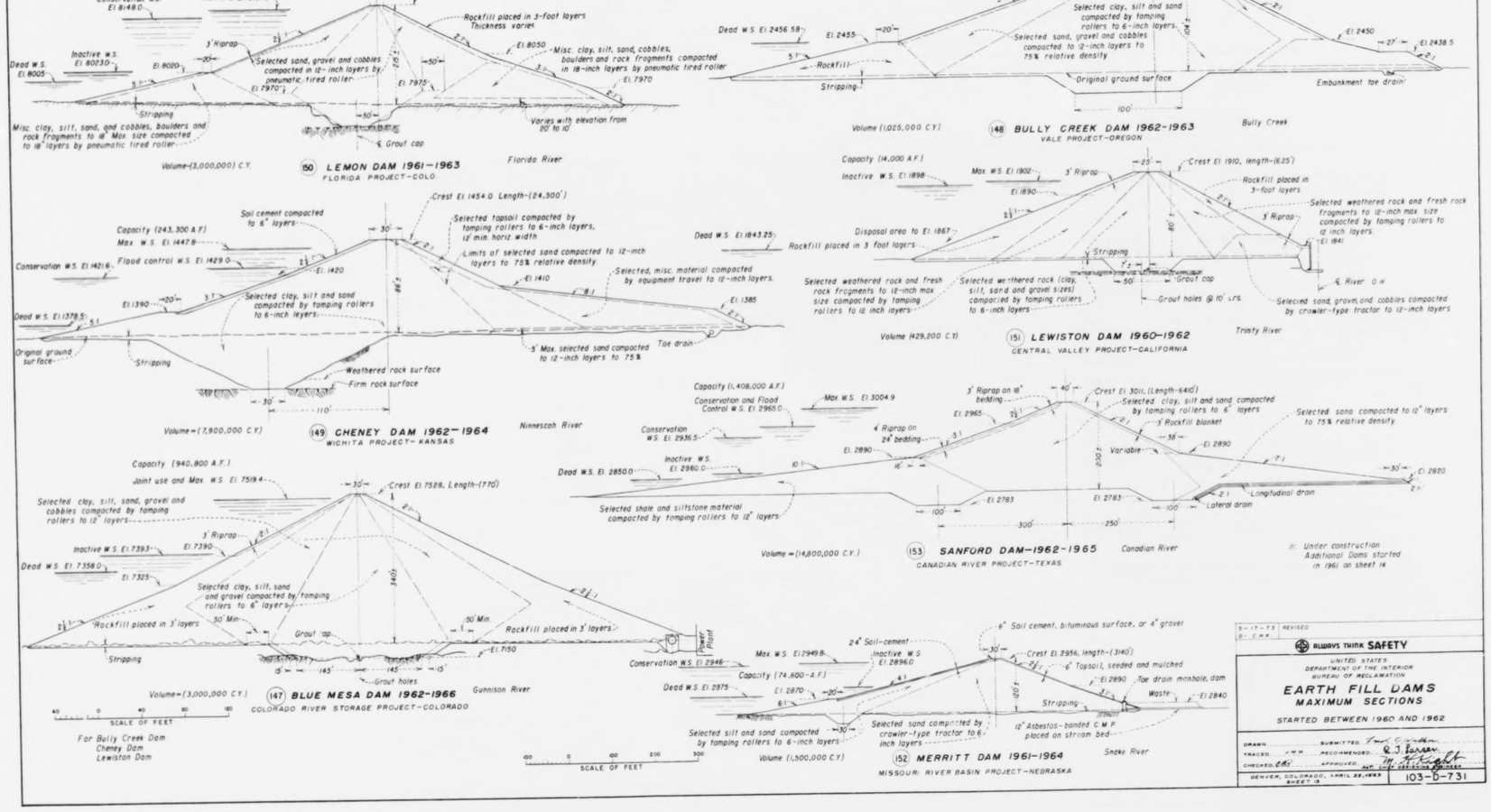
SAN ANGELO PROJECT - TEXAS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

EARTHFILL DAMS
MAXIMUM SECTIONS

STARTED BETWEEN 1959 AND 1960

DRAWN	SUBMITTED	
TRACED E.M.W.	RECOMMENDED	
CHECKED	APPROVED	
DENVER, COLORADO, APR. 22, 1963	SHEET 18	103-D-730


Capacity (40,100 A.F.)
Conservation W.S. El. 8148.0
Max. W.S. El. 8161.0
Crest El. 8167, Length-(1,360')
Rockfill placed in 3-foot layers Thickness varies
3' Riprap
Inactive W.S. El. 8023.0
Dead W.S. El. 8005
El. 8020
El. 8050
Misc. clay, silt, sand, cobbles, boulders and rock fragments compacted in 18-inch layers by pneumatic tired roller
Selected sand, gravel and cobbles compacted in 12-inch layers by pneumatic, tired roller
El. 7970
El. 7975
Stripping
Misc. clay, silt, sand, and cobbles, boulders and rock fragments to 18" Max. size compacted to 18" layers by pneumatic tired roller
Varies with elevation from 20' to 10'
Grout cap
Volume-(3,000,000) C.Y.
50 LEMON DAM 1961-1963
FLORIDA PROJECT-COLO
Florida River
Capacity (31,600 A.F.)
Max. W.S. El. 2523.0
Joint use W.S. El. 2516.0
Crest El. 2529, (Length-3080')
Rockfill
Selected sand, gravel, and cobbles compacted to 12-inch layers to 75% relative density
Selected clay, silt and sand compacted by tamping rollers to 6-inch layers
Selected sand, gravel and cobbles compacted to 12-inch layers to 75% relative density
Dead W.S. El. 2456.58
El. 2455
Rockfill
Stripping
El. 2450
El. 2438.5
Original ground surface
Embankment toe drain
Volume (1,025,000 C.Y.)
148 BULLY CREEK DAM 1962-1963
VALE PROJECT-OREGON
Bully Creek
Capacity (14,000 A.F.)
Inactive W.S. El. 1898
Max. W.S. El. 1902
3' Riprap
Crest El. 1910, length-(625')
Rockfill placed in 3-foot layers
Selected weathered rock and fresh rock fragments to 12-inch max. size compacted by tamping rollers to 12 inch layers
El. 1890
El. 1894
Disposal area to El. 1867
Dead W.S. El. 1843.25
Rockfill placed in 3' foot layers
Stripping
Selected weathered rock and fresh rock fragments to 12-inch max size compacted by tamping rollers to 12 inch layers
Selected weathered rock (clay, silt, sand and gravel sizes) compacted by tamping rollers to 6-inch layers
Grout cap
Grout holes @ 10' Lrs.
℄ River O.W.
Selected sand, gravel, and cobbles compacted by crawler-type tractor to 12-inch layers
Volume (429,200 C.Y.)
151 LEWISTON DAM 1960-1962
CENTRAL VALLEY PROJECT-CALIFORNIA
Trinity River
Capacity (243,300 A.F.)
Max. W.S. El. 1447.9
Flood control W.S. El. 1429.0
Conservation W.S. El. 1421.6
Soil cement compacted to 6" layers
Crest El. 1454.0 Length-(24,500')
Selected topsoil compacted by tamping rollers to 6-inch layers, 12' min. horiz. width
Limits of selected sand compacted to 12-inch layers to 75% relative density
El. 1420
El. 1410
Selected, misc. material compacted by equipment travel to 12-inch layers.
El. 1385
Dead W.S. El. 1378.5
Selected clay, silt and sand compacted by tamping rollers to 6-inch layers
Original ground surface
Stripping
5' Max. selected sand compacted to 12-inch layers to 75%
Toe drain
Weathered rock surface
Firm rock surface
Volume-(7,900,000 C.Y.)
149 CHENEY DAM 1962-1964
WICHITA PROJECT-KANSAS
Ninnescah River
Capacity (1,408,000 A.F.)
Conservation and Flood Control W.S. El. 2965.0
Max. W.S. El. 3004.9
3' Riprap on 18" bedding
Crest El. 3011, (Length-6410')
Selected clay, silt and sand compacted by tamping rollers to 6" layers
3' Rockfill blanket
Selected sand compacted to 12" layers to 75% relative density
Conservation W.S. El. 2936.5
4' Riprap on 24" bedding
El. 2965
El. 2890
Variable
El. 2890
Inactive W.S. El. 2960.0
Dead W.S. El. 2850.0
Selected shale and siltstone material compacted by tamping rollers to 12" layers
El. 2783
El. 2783
Longitudinal drain
Lateral drain
El. 2820
Volume-(14,800,000 C.Y.)
153 SANFORD DAM-1962-1965
CANADIAN RIVER PROJECT-TEXAS
Canadian River
Capacity (940,800 A.F.)
Joint use and Max. W.S. El. 7519.4
Crest El. 7528, Length-(770)
Selected clay, silt, sand, gravel and cobbles compacted by tamping rollers to 12" layers
3' Riprap
Inactive W.S. El. 7393
El. 7390
Dead W.S. El. 7358.0
El. 7325
Selected clay, silt, sand and gravel compacted by tamping rollers to 6" layers
Rockfill placed in 3' layers
50' Min.
Grout cap
Grout holes
Rockfill placed in 3' layers
El. 7150
Power Plant
Volume-(3,000,000 C.Y.)
147 BLUE MESA DAM 1962-1966
COLORADO RIVER STORAGE PROJECT-COLORADO
Gunnison River
SCALE OF FEET
For Bully Creek Dam
Cheney Dam
Lewiston Dam
24" Soil-cement
Max. W.S. El. 2949.8
Conservation W.S. El. 2946
Inactive W.S. El. 2896.0
Capacity (74,600 A.F.)
Dead W.S. El. 2875
El. 2870
Selected silt and sand compacted by tamping rollers to 6-inch layers
Selected sand compacted by crawler-type tractor to 6 inch layers
6" Soil cement, bituminous surface, or 4" gravel
Crest El. 2956, length-(3140')
6' Topsoil, seeded and mulched
El. 2890
Toe drain manhole, dam
Waste
El. 2840
Stripping
12" Asbestos-bonded C.M.P. placed on stream bed
Volume (1,500,000 C.Y.)
152 MERRITT DAM 1961-1964
MISSOURI RIVER BASIN PROJECT-NEBRASKA
Snake River
SCALE OF FEET
* Under construction
Additional Dams started in 1961 on sheet 14

5-17-73 REVISED
D-CMS

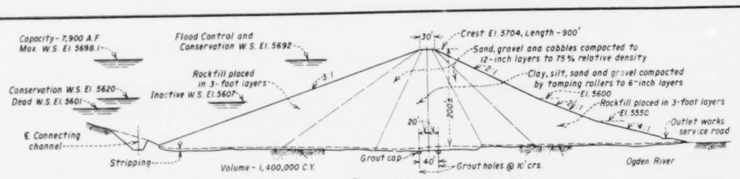
ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

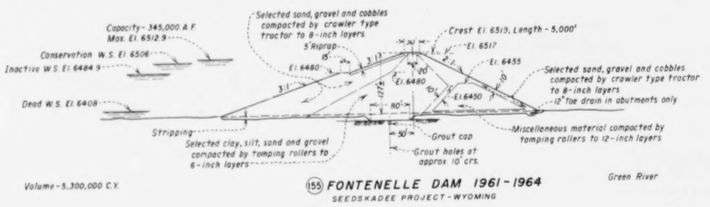
EARTH FILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1960 AND 1962

DRAWN ... SUBMITTED: Earl G. Hall
TRACED ... C.M.P. RECOMMENDED: R. J. Turner
CHECKED: CMS APPROVED: M. N. Wright
DENVER, COLORADO, APRIL 28, 1965
SHEET 13

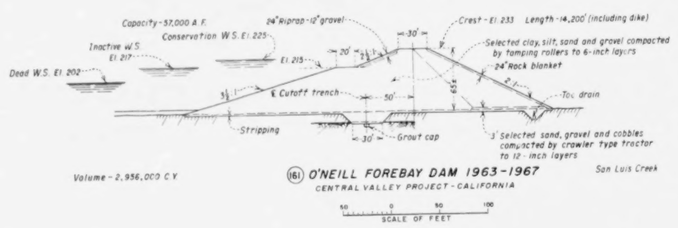
103-D-731


Capacity - 7,900 A.F.
Max. W.S. El. 5698.1
Conservation W.S. El. 5620
Dead W.S. El. 5601
Flood Control and Conservation W.S. El. 5692
Rockfill placed in 3-foot layers
Inactive W.S. El. 5607
℄ Connecting channel
Stripping
Volume - 1,400,000 C.Y.
30'
Crest El. 5704, Length - 900'
Sand, gravel and cobbles compacted to 12-inch layers to 75 % relative density
Clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
El. 5600
Rockfill placed in 3-foot layers
El. 5550
Outlet works service road
200'
20'
40'
Grout cap
Grout holes @ 10' crs.
Ogden River

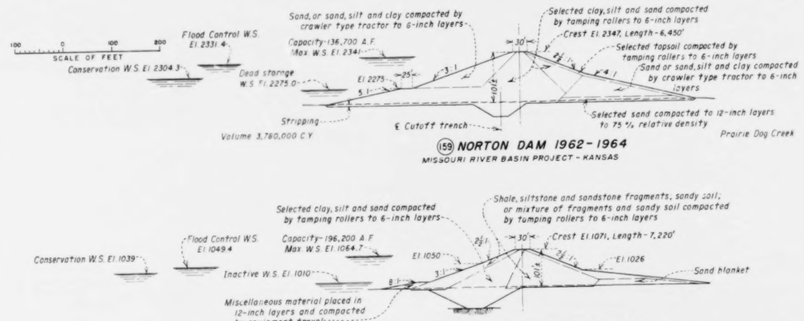
(157) CAUSEY DAM 1962-1966
WEBER BASIN PROJECT - UTAH


Capacity - 345,000 A.F.
Max. El. 6512.9
Conservation W.S. El. 6506
Inactive W.S. El. 6484.9
Dead W.S. El. 6408
Selected sand, gravel and cobbles compacted by crawler type tractor to 8-inch layers
5' riprap
Crest El. 6519, Length - 5,000'
El. 6517
El. 6455
El. 6480
El. 6450
Selected sand, gravel and cobbles compacted by crawler type tractor to 8-inch layers
12" toe drain in abutments only
Stripping
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Grout cap
Grout holes at approx. 10' crs.
Miscellaneous material compacted by tamping rollers to 12-inch layers
Volume - 5,300,000 C.Y.
Green River

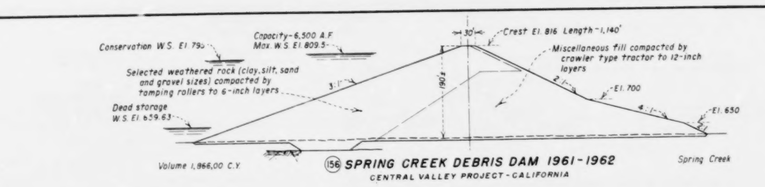
(155) FONTENELLE DAM 1961 - 1964
SEEDSKADEE PROJECT - WYOMING


Capacity - 57,000 A.F.
Conservation W.S. El. 225
Inactive W.S. El. 217
Dead W.S. El. 202
24" riprap - 12" gravel
El. 215
℄ Cutoff trench
Stripping
Crest - El. 233 Length - 14,200' (including dike)
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
24" rock blanket
Toe drain
Grout cap
Selected sand, gravel and cobbles compacted by crawler type tractor to 12 - inch layers
Volume - 2,956,000 C.Y.
San Luis Creek

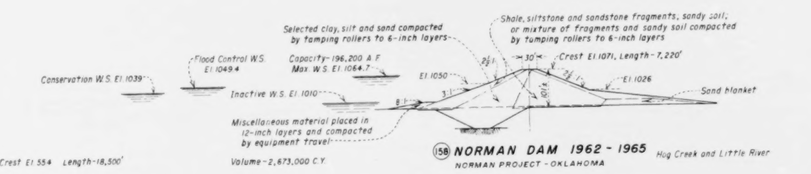
(161) O'NEILL FOREBAY DAM 1963-1967
CENTRAL VALLEY PROJECT - CALIFORNIA


SCALE OF FEET
Flood Control W.S. El. 2331.4
Conservation W.S. El. 2304.3
Capacity - 136,700 A.F.
Max. W.S. El. 2341
Dead storage W.S. El. 2275.0
El. 2275
Sand or sand, silt and clay compacted by crawler type tractor to 6-inch layers
Selected clay, silt and sand compacted by tamping rollers to 6-inch layers
Crest El. 2347, Length - 6,450'
Selected topsoil compacted by tamping rollers to 6-inch layers
Sand or sand, silt and clay compacted by crawler type tractor to 6-inch layers
Selected sand compacted to 12-inch layers to 75 % relative density
Stripping
℄ Cutoff trench
Volume 3,760,000 C.Y.
Prairie Dog Creek

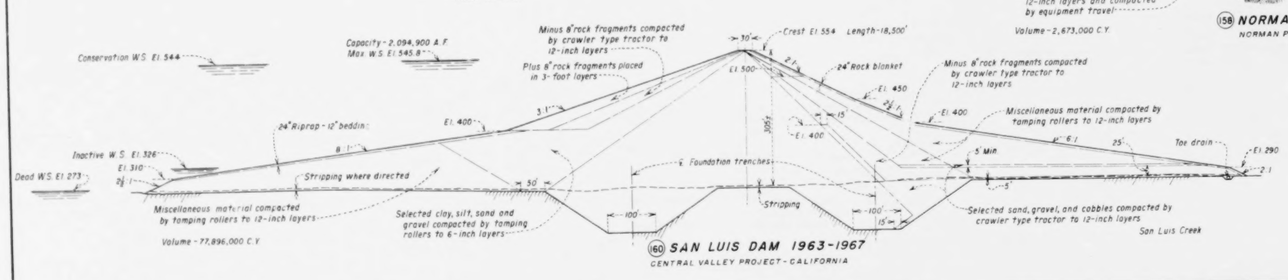
(159) NORTON DAM 1962 - 1964
MISSOURI RIVER BASIN PROJECT - KANSAS


Active conservation W.S. El. 5535.7
Dead W.S. El. 5455
Capacity - 261,000 A.F.
Max. W.S. El. 5571.9
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Inactive W.S. El. 5470.6
Selected sand, gravel and cobbles compacted by crawler type tractor to 8-inch layers
36'
Crest El. 5578, Length - 2,950'
El. 5520
Miscellaneous material compacted by crawler type tractor to 12-inch layers
El. 5460
Volume - 1,845,000 C.Y.
Beaverhead River

(154) CLARK CANYON DAM 1961 - 1964
MISSOURI RIVER BASIN PROJECT - MONTANA


Selected clay, silt and sand compacted by tamping rollers to 6-inch layers
Shale, siltstone and sandstone fragments, sandy soil, or mixture of fragments and sandy soil compacted by tamping rollers to 6-inch layers
Flood Control W.S. El. 1049.4
Capacity - 196,200 A.F.
Max. W.S. El. 1064.7
Conservation W.S. El. 1039
Inactive W.S. El. 1010
El. 1050
Crest El. 1071, Length - 7,220'
El. 1026
Sand blanket
Miscellaneous material placed in 12-inch layers and compacted by equipment travel
Volume - 2,673,000 C.Y.
Hog Creek and Little River

(158) NORMAN DAM 1962 - 1965
NORMAN PROJECT - OKLAHOMA


Conservation W.S. El. 544
Capacity - 2,094,900 A.F.
Max. W.S. El. 545.8
Minus 8" rock fragments compacted by crawler type tractor to 12-inch layers
Plus 8" rock fragments placed in 3- foot layers
Crest El. 554 Length - 18,500'
El. 500
24" Rock blanket
El. 450
Minus 8" rock fragments compacted by crawler type tractor to 12-inch layers
El. 400
Miscellaneous material compacted by tamping rollers to 12-inch layers
Toe drain
El. 290
Inactive W.S. El. 326
El. 310
Dead W.S. El. 273
24" Riprap - 12" bedding
Stripping where directed
Foundation trenches
Miscellaneous material compacted by tamping rollers to 12-inch layers
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Stripping
Selected sand, gravel, and cobbles compacted by crawler type tractor to 12-inch layers
Volume - 77,896,000 C.Y.
San Luis Creek

(160) SAN LUIS DAM 1963-1967
CENTRAL VALLEY PROJECT - CALIFORNIA

Conservation W.S. El. 794
Dead storage W.S. El. 659.63
Capacity - 6,500 A.F.
Max. W.S. El. 809.5
Selected weathered rock (clay, silt, sand and gravel sizes) compacted by tamping rollers to 6-inch layers
Crest El. 816 Length - 1,140'
Miscellaneous fill compacted by crawler type tractor to 12-inch layers
El. 700
El. 650
Volume 1,866,00 C.Y.
Spring Creek

(156) SPRING CREEK DEBRIS DAM 1961 - 1962
CENTRAL VALLEY PROJECT - CALIFORNIA

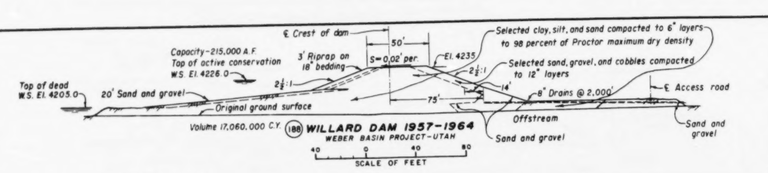
5-17-73 D-C.H.K.	REVISED

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

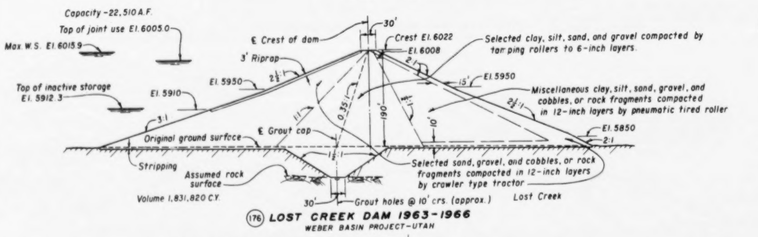
EARTHFILL DAMS
MAXIMUM SECTIONS

STARTED BETWEEN 1961 AND 1963

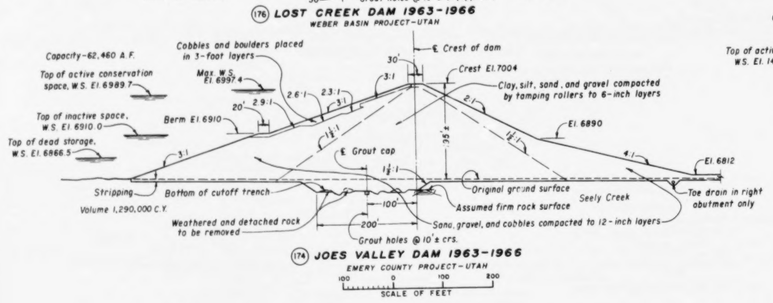
DRAWN ... SUBMITTED ... R. C. Wilson
TRACED ... E.M.W. RECOMMENDED ... R. J. Laney
CHECKED ... D.C. APPROVED ... M. W. Straub
DENVER, COLORADO, APR. 22, 1963 — SHEET 19 — 103-D-732


℄ Crest of dam
50'
Capacity-215,000 A.F.
Top of active conservation W.S. El. 4226.0
3' Riprap on 18" bedding
S=0.02' per
El. 4235
Selected clay, silt, and sand compacted to 6" layers to 98 percent of Proctor maximum dry density
Selected sand, gravel, and cobbles compacted to 12" layers
Top of dead W.S. El. 4205.0
20' Sand and gravel
Original ground surface
75'
14'
8" Drains @ 2,000'
Offstream
℄ Access road
Sand and gravel
Volume 17,060,000 C.Y.
40 0 40 80
SCALE OF FEET

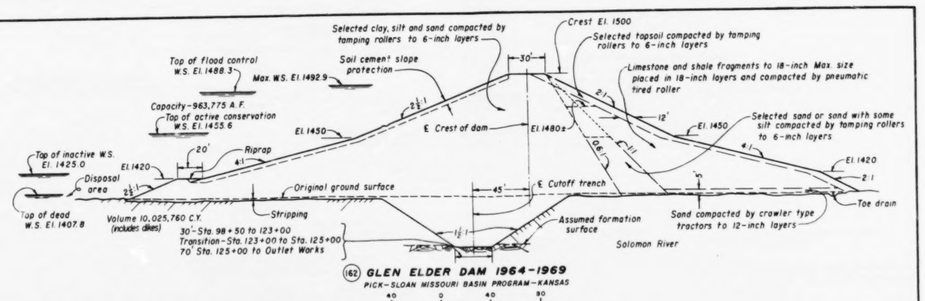
(188) **WILLARD DAM 1957-1964**
WEBER BASIN PROJECT-UTAH


Capacity-22,510 A.F.
Top of joint use El. 6005.0
Max. W.S. El. 6015.9
℄ Crest of dam
30'
Crest El. 6022
El. 6008
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers.
3' Riprap
El. 5950
Top of inactive storage El. 5912.3
El. 5910
Miscellaneous clay, silt, sand, gravel, and cobbles, or rock fragments compacted in 12-inch layers by pneumatic tired roller
El. 5850
Original ground surface
℄ Grout cap
Stripping
Assumed rock surface
Selected sand, gravel, and cobbles, or rock fragments compacted in 12-inch layers by crawler type tractor
Volume 1,831,820 C.Y.
30'
Grout holes @ 10' crs. (approx.)
Lost Creek

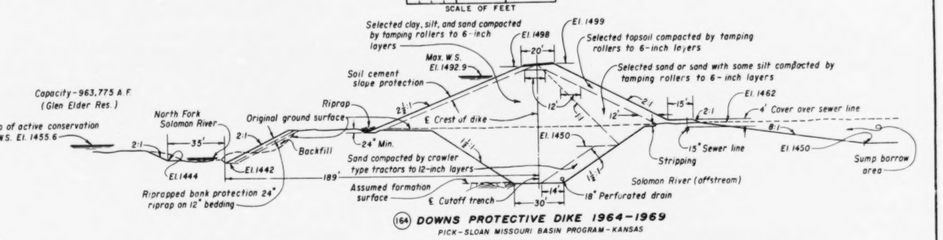
(176) **LOST CREEK DAM 1963-1966**
WEBER BASIN PROJECT-UTAH


Capacity-62,460 A.F.
Cobbles and boulders placed in 3-foot layers
℄ Crest of dam
30'
Top of active conservation space, W.S. El. 6989.7
Max. W.S. El. 6997.4
Crest El. 7004
Clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers
Top of inactive space, W.S. El. 6910.0
Berm El. 6910
El. 6890
Top of dead storage, W.S. El. 6866.5
℄ Grout cap
El. 6812
Stripping
Bottom of cutoff trench
Original ground surface
Seely Creek
Toe drain in right abutment only
Volume 1,290,000 C.Y.
Assumed firm rock surface
Weathered and detached rock to be removed
100'
200'
Sand, gravel, and cobbles compacted to 12-inch layers
Grout holes @ 10'± crs.

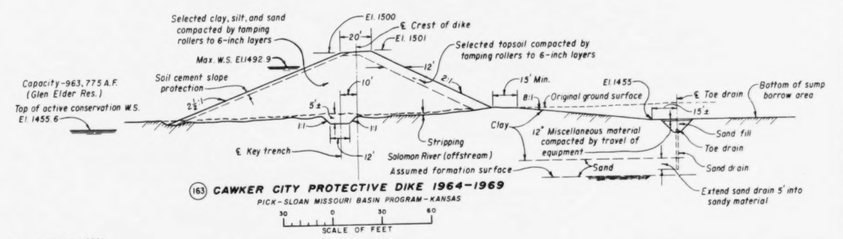
(174) **JOES VALLEY DAM 1963-1966**
EMERY COUNTY PROJECT-UTAH
100 0 100 200
SCALE OF FEET


Selected clay, silt and sand compacted by tamping rollers to 6-inch layers
Crest El. 1500
Selected topsoil compacted by tamping rollers to 6-inch layers
Top of flood control W.S. El. 1488.3
Soil cement slope protection
Max. W.S. El. 1492.9
Limestone and shale fragments to 18-inch Max. size placed in 18-inch layers and compacted by pneumatic tired roller
Capacity-963,775 A.F.
Top of active conservation W.S. El. 1455.6
El. 1450
℄ Crest of dam
El. 1480±
Selected sand or sand with some silt compacted by tamping rollers to 6-inch layers
Riprap
El. 1420
Top of inactive W.S. El. 1425.0
Disposal area
Original ground surface
℄ Cutoff trench
Toe drain
Stripping
Top of dead W.S. El. 1407.8
Volume 10,025,760 C.Y. (includes dikes)
Assumed formation surface
Sand compacted by crawler type tractors to 12-inch layers
30'-Sta. 98+50 to 123+00
Transition-Sta. 123+00 to Sta. 125+00
70' Sta. 125+00 to Outlet Works
Salomon River

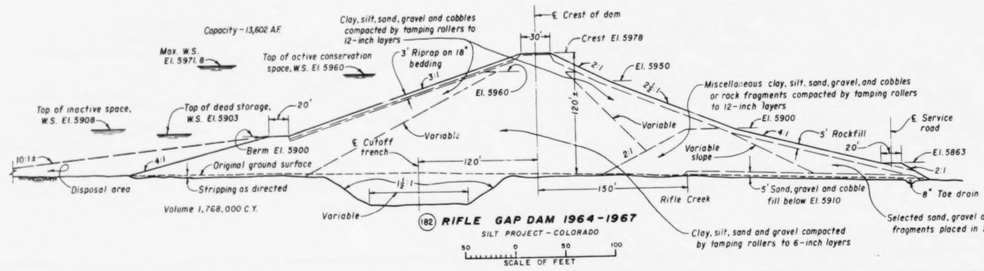
(162) **GLEN ELDER DAM 1964-1969**
PICK-SLOAN MISSOURI BASIN PROGRAM-KANSAS
40 0 40 80
SCALE OF FEET


Selected clay, silt, and sand compacted by tamping rollers to 6-inch layers
El. 1499
El. 1498
Selected topsoil compacted by tamping rollers to 6-inch layers
Max. W.S. El. 1492.9
Selected sand or sand with some silt compacted by tamping rollers to 6-inch layers
Soil cement slope protection
Capacity-963,775 A.F. (Glen Elder Res.)
Riprap
El. 1462
4" Cover over sewer line
Top of active conservation W.S. El. 1455.6
North Fork Solomon River
Original ground surface
℄ Crest of dike
El. 1450
Backfill
24" Min.
15" Sewer line
El. 1450
Sump borrow area
Stripping
El. 1444
El. 1442
189'
Sand compacted by crawler type tractors to 12-inch layers
Solomon River (offstream)
Riprapped bank protection 24" riprap on 12" bedding
Assumed formation surface
18" Perforated drain
℄ Cutoff trench
30'

(164) **DOWNS PROTECTIVE DIKE 1964-1969**
PICK-SLOAN MISSOURI BASIN PROGRAM-KANSAS



(163) **CAWKER CITY PROTECTIVE DIKE 1964-1969**
PICK-SLOAN MISSOURI BASIN PROGRAM-KANSAS


Capacity-13,602 A.F.
Clay, silt, sand, gravel and cobbles compacted by tamping rollers to 12-inch layers
℄ Crest of dam
30'
Crest El. 5978
Max. W.S. El. 5971.8
Top of active conservation space, W.S. El. 5960
3' Riprap on 18" bedding
El. 5950
El. 5960
Miscellaneous clay, silt, sand, gravel, and cobbles or rock fragments compacted by tamping rollers to 12-inch layers
Top of inactive space, W.S. El. 5908
Top of dead storage, W.S. El. 5903
20'
Variable
Variable
120'±
Variable slope
El. 5900
5' Rockfill
20'
℄ Service road
El. 5863
10:1
Berm El. 5900
℄ Cutoff trench
120'
150'
Original ground surface
Stripping as directed
Disposal area
Volume 1,768,000 C.Y.
Rifle Creek
5' Sand, gravel and cobble fill below El. 5910
8" Toe drain
Clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Selected sand, gravel and cobbles or rock fragments placed in 24-inch layers

(182) **RIFLE GAP DAM 1964-1967**
SILT PROJECT - COLORADO
50 0 50 100
SCALE OF FEET

ILLINOIS THINK **SAFETY**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

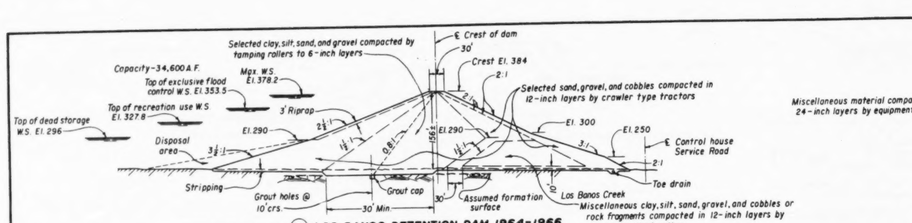
EARTHFILL DAMS
MAXIMUM SECTIONS

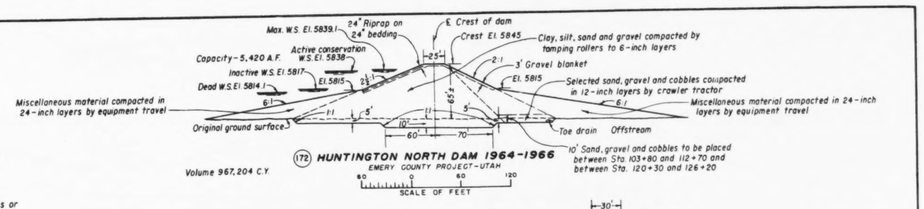
STARTED BETWEEN 1957 AND 1964

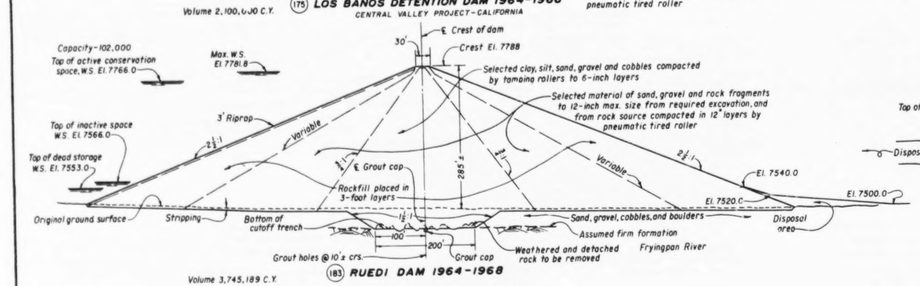
DESIGNED Charles M. Ireland SUBMITTED Richard W. Beck
DRAWN Richard A. Wall RECOMMENDED A. J. Peterka
CHECKED [illegible] APPROVED James Ned
CHIEF, DIVISION OF DESIGN

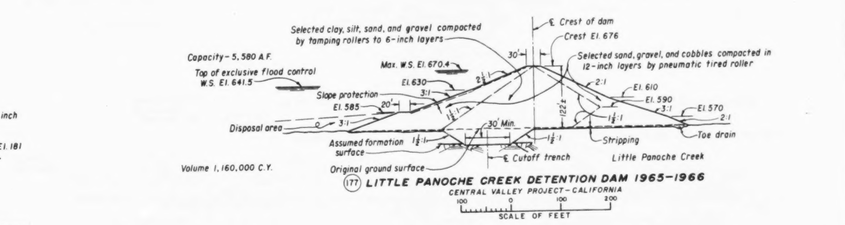
DENVER, COLORADO, MAY 31, 1973
SHEET 19

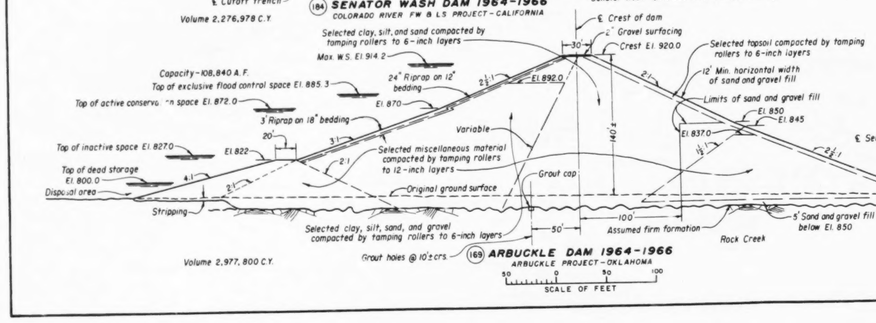
103-D-1358

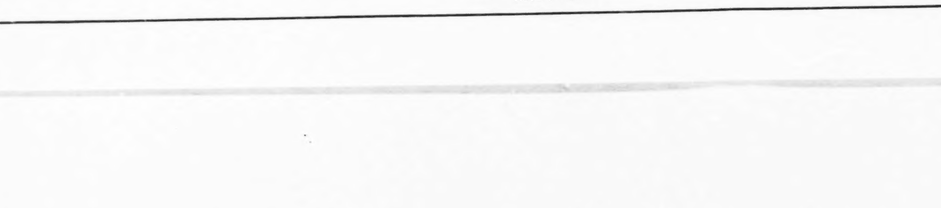

Capacity-34,600 A.F.
Top of exclusive flood control W.S. El. 353.5
Top of recreation use W.S. El. 327.8
Top of dead storage W.S. El. 296
Max. W.S. El. 378.2
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers
℄ Crest of dam
Crest El. 384
Selected sand, gravel, and cobbles compacted in 12-inch layers by crawler type tractors
3' Riprap
El. 290
El. 300
El. 250
℄ Control house Service Road
Disposal area
Stripping
Grout holes @ 10' crs.
Grout cap
30' Min.
Assumed formation surface
Los Banos Creek
Toe drain
Miscellaneous clay, silt, sand, gravel, and cobbles or rock fragments compacted in 12-inch layers by pneumatic tired roller
Volume 2,100,000 C.Y.
(175) LOS BANOS DETENTION DAM 1964-1966
CENTRAL VALLEY PROJECT-CALIFORNIA

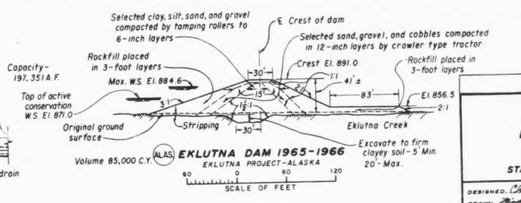

Max. W.S. El. 5839.1
24" Riprap on 24" bedding
℄ Crest of dam
Crest El. 5845
Clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Capacity-5,420 A.F.
Active conservation W.S. El. 5838
Inactive W.S. El. 5817
Dead W.S. El. 5814.1
El. 5815
3' Gravel blanket
Selected sand, gravel and cobbles compacted in 12-inch layers by crawler tractor
Miscellaneous material compacted in 24-inch layers by equipment travel
Original ground surface
Toe drain
Offstream
10' Sand, gravel and cobbles to be placed between Sta. 103+80 and 112+70 and between Sta. 120+30 and 126+20
Volume 967,204 C.Y.
(172) HUNTINGTON NORTH DAM 1964-1966
EMERY COUNTY PROJECT-UTAH
SCALE OF FEET


Capacity-102,000
Top of active conservation space, W.S. El. 7766.0
Top of inactive space W.S. El. 7566.0
Top of dead storage W.S. El. 7553.0
Max. W.S. El. 778.8
℄ Crest of dam
Crest El. 7788
Selected clay, silt, sand, gravel and cobbles compacted by tamping rollers to 6-inch layers
Selected material of sand, gravel and rock fragments to 12-inch max. size from required excavation, and from rock source compacted in 12' layers by pneumatic tired roller
3' Riprap
Variable
℄ Grout cap
Rockfill placed in 3-foot layers
El. 7540.0
El. 7520.0
El. 7500.0
Original ground surface
Stripping
Bottom of cutoff trench
Sand, gravel, cobbles, and boulders
Assumed firm formation
Disposal area
Grout holes @ 10'± crs.
Grout cap
Weathered and detached rock to be removed
Fryingpan River
Volume 3,745,189 C.Y.
(183) RUEDI DAM 1964-1968
FRYINGPAN-ARKANSAS PROJECT-COLORADO
SCALE OF FEET


Capacity-12,950 A.F.
Top of active conservation W.S. El. 2889
Top of dead W.S. El. 2822
Max. W.S. El. 2897.1
℄ Crest of dam
Crest El. 2903
El. 2900
Clay, silt, and sand compacted by tamping rollers to 6-inch layers
El. 2885
El. 2860
Sand, gravel, and cobbles compacted by crawler type tractors in 12-inch layers
Sand, gravel, and cobbles compacted by crawler type tractors in 12-inch layers
24" Riprap
Top of inactive W.S. El. 2825
El. 2822
℄ Cutoff trench
Disposal area
Stripping as directed
Sand compacted by tamping rollers to 6-inch layers
Assumed formation surface
Cutoff trench bottom width-15' Min.
Grout holes at 10'± crs.
Mann Creek
Original ground surface
Volume 1,121,588 C.Y.
(179) MANN CREEK DAM 1965-1967
MANN CREEK PROJECT-IDAHO
SCALE OF FEET


Capacity-13,836 A.F.
Top of active conservation W.S. El. 251.0
Top of inactive storage W.S. El. 210.0
Compacted blanket
Max. W.S. El. 258.9
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers
℄ Crest of dam
Crest El. 265
3' Riprap
El. 230
El. 210
Selected miscellaneous material compacted in 12-inch layers by pneumatic tired roller
Service road No. 2
Selected sand, gravel, and cobbles compacted in 12-inch layers by crawler type tractor
El. 185
W.S. El. 181
℄ Cutoff trench
Stripping as directed
Original ground surface
Senator Wash-Colorado River Pumped Storage
Volume 2,276,978 C.Y.
(184) SENATOR WASH DAM 1964-1968
COLORADO RIVER FW & LS PROJECT-CALIFORNIA


Capacity-108,840 A.F.
Top of exclusive flood control space El. 885.3
Top of active conservation space El. 872.0
Top of inactive space El. 827.0
Top of dead storage El. 800.0
Disposal area
Max. W.S. El. 914.2
Selected clay, silt, and sand compacted by tamping rollers to 6-inch layers
℄ Crest of dam
2' Gravel surfacing
Crest El. 920.0
Selected topsoil compacted by tamping rollers to 6-inch layers
12' Min. horizontal width of sand and gravel fill
Limits of sand and gravel fill
24" Riprap on 12" bedding
El. 892.0
El. 870
3' Riprap on 18" bedding
El. 822
El. 850
El. 845
El. 837.0
Variable
Selected miscellaneous material compacted by tamping rollers to 12-inch layers
Grout cap
℄ Service road
Original ground surface
Stripping
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers
Grout holes @ 10'± crs.
Assumed firm formation
Rock Creek
5' Sand and gravel fill below El. 850
Toe drain
Volume 2,977,800 C.Y.
(169) ARBUCKLE DAM 1964-1966
ARBUCKLE PROJECT-OKLAHOMA
SCALE OF FEET


Capacity-197,351 A.F.
Top of active conservation W.S. El. 871.0
Original ground surface
Rockfill placed in 3-foot layers
Max. W.S. El. 884.6
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers
℄ Crest of dam
Crest El. 891.0
Selected sand, gravel, and cobbles compacted in 12-inch layers by crawler type tractor
Rockfill placed in 3-foot layers
El. 856.5
Stripping
Eklutna Creek
Excavate to firm clayey soil-5' Min. 20'-Max.
Volume 85,000 C.Y.
(ALAS) EKLUTNA DAM 1965-1966
EKLUTNA PROJECT-ALASKA
SCALE OF FEET

ALWAYS THINK SAFETY

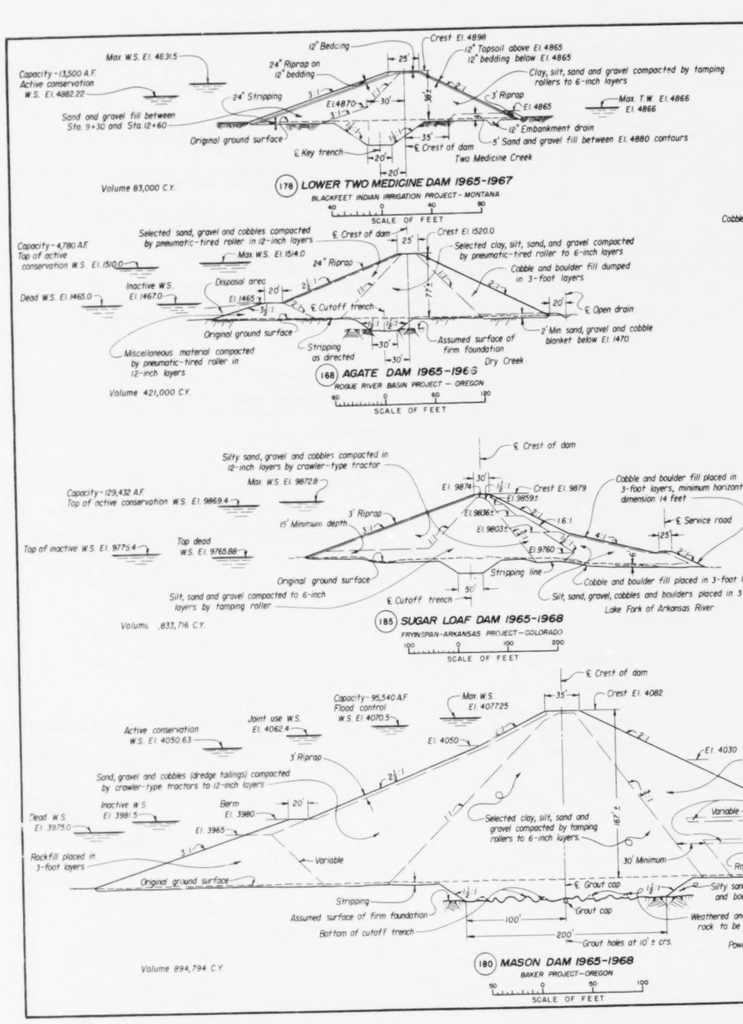
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

EARTHFILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1964 AND 1965

DESIGNED: Charles Thurbel ... SUBMITTED: Richard H. Goh
DRAWN: Richard L. Watt ... RECOMMENDED: C.F. Izzard
CHECKED: P.C. Conley ... APPROVED: Jonathan Watt
CHIEF, DIVISION OF DESIGN

DENVER, COLORADO, MAY 21, 1973
SHEET 18

103-D-1359


Max. W.S. El. 4631.5
Capacity - 13,500 A.F.
Active conservation W.S. El. 4882.22
12" Bedding
Crest El. 4898
12" Topsoil above El. 4865
12" bedding below El. 4865
24" Riprap on 12" bedding
Clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
24" Stripping
3' Riprap
El. 4870
El. 4865
Max. T.W. El. 4866
El. 4866
Sand and gravel fill between Sta. 9+30 and Sta. 12+60
12" Embankment drain
Original ground surface
5' Sand and gravel fill between El. 4880 contours
℄ Key trench
℄ Crest of dam
Two Medicine Creek
Volume 83,000 C.Y.
178 LOWER TWO MEDICINE DAM 1965-1967
BLACKFEET INDIAN IRRIGATION PROJECT - MONTANA
SCALE OF FEET
Capacity - 4,780 A.F.
Top of active conservation W.S. El. 1510.0
Selected sand, gravel and cobbles compacted by pneumatic-tired roller in 12-inch layers
Max. W.S. El. 1514.0
Crest El. 1520.0
Selected clay, silt, sand, and gravel compacted by pneumatic-tired roller to 6-inch layers
Cobble and boulder fill dumped in 3-foot layers
Dead W.S. El. 1465.0
Inactive W.S. El. 1467.0
Disposal area
El. 1465
℄ Cutoff trench
℄ Open drain
2' Min. sand, gravel and cobble blanket below El. 1470
Original ground surface
Miscellaneous material compacted by pneumatic-tired roller in 12-inch layers
Stripping as directed
Assumed surface of firm foundation
Dry Creek
Volume 421,000 C.Y.
168 AGATE DAM 1965-1965
ROGUE RIVER BASIN PROJECT - OREGON
SCALE OF FEET
Capacity - 129,432 A.F.
Top of active conservation W.S. El. 9869.4
Silty sand, gravel and cobbles compacted in 12-inch layers by crawler-type tractor
Max. W.S. El. 9872.8
℄ Crest of dam
El. 9874
Crest El. 9879
El. 9859.1
Cobble and boulder fill placed in 3-foot layers, minimum horizontal dimension 14 feet
3' Riprap
15' Minimum depth
℄ Service road
Top of inactive W.S. El. 9775.4
Top dead W.S. El. 9765.88
Original ground surface
Stripping line
Cobble and boulder fill placed in 3-foot layers
Silt, sand and gravel compacted to 6-inch layers by tamping roller
℄ Cutoff trench
Silt, sand, gravel, cobbles and boulders placed in 3-foot layers
Lake Fork of Arkansas River
Volume 833,716 C.Y.
185 SUGAR LOAF DAM 1965-1968
FRYINGPAN-ARKANSAS PROJECT - COLORADO
SCALE OF FEET
Capacity - 95,540 A.F. Flood control W.S. El. 4070.5
Max. W.S. El. 407725
℄ Crest of dam
Crest El. 4082
Joint use W.S. El. 4062.4
Active conservation W.S. El. 4050.63
El. 4050
El. 4030
3' Riprap
Sand, gravel and cobbles (dredge tailings) compacted by crawler-type tractors to 12-inch layers
Sand, gravel and cobbles (dredge tailings) compacted by crawler-type tractors to 12-inch layers
Cobbles and boulders placed in 3-foot layers
Inactive W.S. El. 3981.5
Berm El. 3980
Dead W.S. El. 3975.0
El. 3965
Variable
El. 3973
El. 3970
El. 3962
El. 3955
El. 3950
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
Rockfill placed in 3-foot layers
Original ground surface
30' Minimum
Rockfill placed in 3-foot layers
3' Selected rock blanket
℄ Grout cap
Silty sand, gravel, cobbles and boulders
Toe drain in right abutment only
Stripping
Assumed surface of firm foundation
Grout cap
Weathered and detached rock to be removed
Bottom of cutoff trench
Grout holes at 10' ± crs.
Powder River
Volume 894,794 C.Y.
180 MASON DAM 1965-1968
BAKER PROJECT - OREGON
SCALE OF FEET
Capacity - 13,520 A.F.
Top of active conservation W.S. El. 8925.6
Selected clay, silt, sand, gravel and cobbles, to 5-inch max. size, compacted by tamping rollers to 6-inch layers
Max. W.S. El. 8931.6
℄ Crest of dam
Crest El. 8938.0
℄ Service road
Selected sand, gravel and cobbles, to 12-inch max. size, compacted in 12-inch layers by crawler-type tractor
Selected sand, gravel and cobbles, to 12-inch max. size, compacted in 12-inch layers by crawler-type tractor
El. 8850.0
Top of dead W.S. El. 8836.0
Top of inactive W.S. El. 8840.5
Variable
℄ Service road
℄ Cutoff trench
Disposal area
Original ground surface
Cobbles and boulders placed in 3-foot layers
Stripping
Cimarron Creek
Glacial material
Volume 1,278,140 C.Y.
186 SILVER JACK DAM 1966-1971
BOSTWICK PARK PROJECT - COLORADO
SCALE OF FEET
℄ Crest of dam
24" Riprap on 12" bedding
4" Crushed gravel or rock surfacing
Crest El. 217
Max. W.S. El. 211
Capacity - 2,095 A.F.
Top of active conservation W.S. El. 205
Clay, silt and sand compacted by tamping rollers to 6-inch layers
El. 180
Selected topsoil compacted by tamping rollers to 6-inch layers
Top of inactive W.S. El. 169
El. 150
Top of dead W.S. El. 150
Disposal area
Original ground surface
Stripping as directed
12" Toe drain
Formation material compacted by tamping rollers to 12-inch layers
Stripping as directed
5' Sand and gravel blanket
Offstream
Grout holes @ approx. 10 CY's
Grout cap
Volume 640,920 C.Y.
170 CONTRA LOMA DAM 1966-1967
CENTRAL VALLEY PROJECT - CALIFORNIA
SCALE OF FEET
Capacity - 33,090 A.F.
Top of active conservation W.S. El. 8687.0
Max. W.S. El. 8699.6
Selected clay, silt, sand and gravel compacted by tamping rollers to 6-inch layers
℄ Crest of dam
Crest El. 8706.0
Selected sand, gravel and cobbles compacted by crawler-type tractor in 12-inch layers
El. 8670
El. 8650
Cobble and boulder fill dumped in 3-foot layers
3' Riprap
Top of dead W.S. El. 8582.0
Top of inactive W.S. El. 8585.0
El. 8580
El. 8590
El. 8555
Disposal area
Toe drain
Original ground surface
Assumed surface of firm foundation
10' Min. sand and gravel blanket, below El. 8670
Miscellaneous material compacted by crawler-type tractors in 12-inch layers
Stripping as directed
℄ Cutoff trench
Blacks Fork
Volume 3,498,000 C.Y.
181 MEEKS CABIN DAM 1966-1971
LYMAN PROJECT - WYOMING
SCALE OF FEET

ALWAYS THINK SAFETY

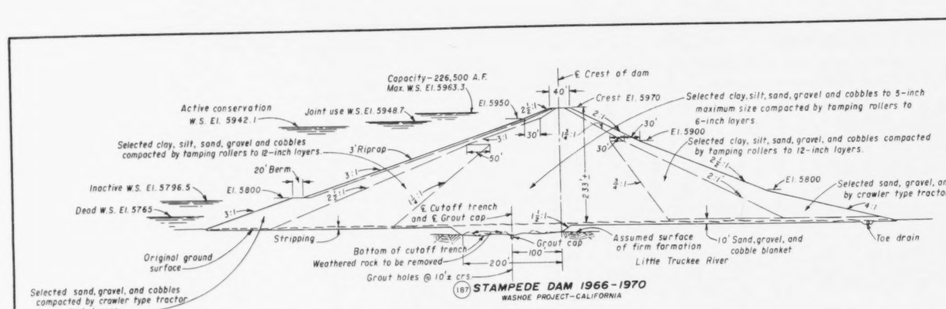
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

EARTHFILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1965 AND 1966

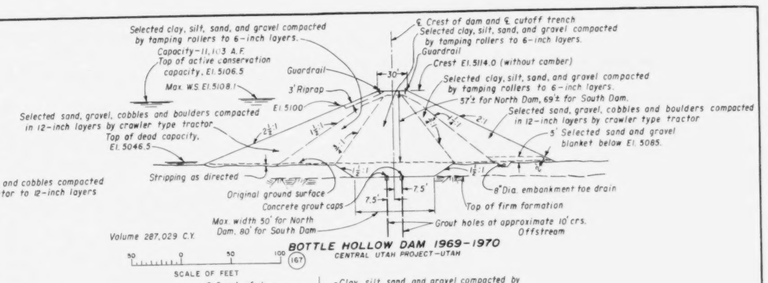
DESIGNED Charles W. Winkel ... SUBMITTED Richard W. Firth
DRAWN H.V. Pochobey ... RECOMMENDED A.J. Cooper
CHECKED E. Ellis Mobley ... APPROVED Charles W. Winkel
Chief, Division of Design

DENVER, COLORADO, MAY 21, 1973
SHEET 17

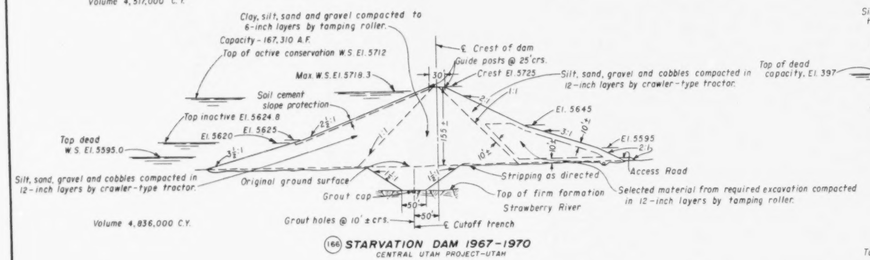
103-D-1360


Capacity – 226,500 A.F.
Max. W.S. El. 5963.3
℄ Crest of dam
Crest El. 5970
El. 5950
Joint use W.S. El. 5948.7
Active conservation W.S. El. 5942.1
Selected clay, silt, sand, gravel and cobbles to 5-inch maximum size compacted by tamping rollers to 6-inch layers
Selected clay, silt, sand, gravel, and cobbles compacted by tamping rollers to 12-inch layers.
3' Riprap
20' Berm
Inactive W.S. El. 5796.5
El. 5800
Dead W.S. El. 5765
El. 5900
El. 5800
Selected sand, gravel, and cobbles compacted by crawler type tractor to 12-inch layers
℄ Cutoff trench and ℄ Grout cap
Stripping
Grout cap
Assumed surface of firm formation
10' Sand, gravel, and cobble blanket
Toe drain
Original ground surface
Bottom of cutoff trench
Weathered rock to be removed
Little Truckee River
Grout holes @ 10'± crs.
Selected sand, gravel, and cobbles compacted by crawler type tractor to 12-inch layers.
Volume 4,517,000 C.Y.

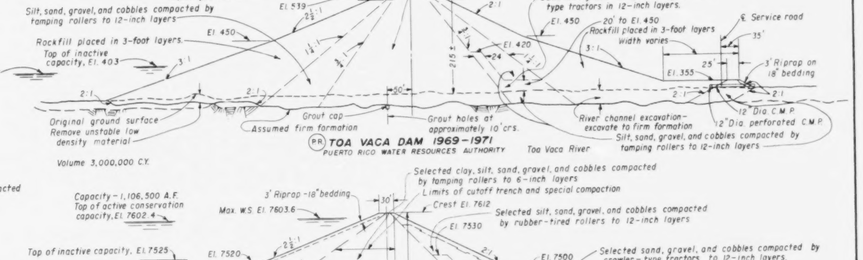
(187) **STAMPEDE DAM 1966–1970**
WASHOE PROJECT–CALIFORNIA


Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers.
Capacity – 11,113 A.F.
Top of active conservation capacity, El. 5106.5
Max. W.S. El. 5108.1
℄ Crest of dam and ℄ cutoff trench
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers.
Guardrail
Crest El. 5114.0 (without camber)
Selected clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers.
57'± for North Dam, 69'± for South Dam.
Selected sand, gravel, cobbles and boulders compacted in 12-inch layers by crawler type tractor
5' Selected sand and gravel blanket below El. 5085.
3' Riprap
El. 5100
Selected sand, gravel, cobbles and boulders compacted in 12-inch layers by crawler type tractor
Top of dead capacity, El. 5046.5
Stripping as directed
Original ground surface
Concrete grout caps
8" Dia. embankment toe drain
Top of firm formation
Max. width 50' for North Dam, 80' for South Dam
Grout holes at approximate 10' crs.
Offstream
Volume 287,029 C.Y.
SCALE OF FEET

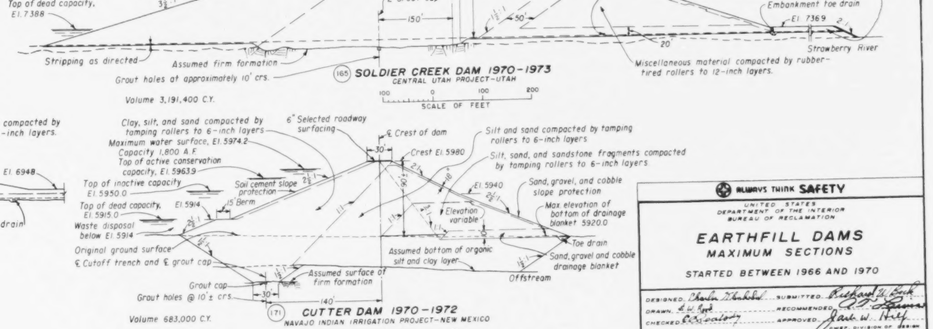
(167) **BOTTLE HOLLOW DAM 1969–1970**
CENTRAL UTAH PROJECT–UTAH


Clay, silt, sand and gravel compacted to 6-inch layers by tamping roller.
Capacity – 167,310 A.F.
Top of active conservation W.S. El. 5712
Max. W.S. El. 5718.3
℄ Crest of dam
Guide posts @ 25' crs.
Crest El. 5725
Silt, sand, gravel and cobbles compacted in 12-inch layers by crawler-type tractor.
Soil cement slope protection
Top inactive El. 5624.8
El. 5620
El. 5625
El. 5645
El. 5595
Top dead W.S. El. 5595.0
Silt, sand, gravel and cobbles compacted in 12-inch layers by crawler-type tractor.
Original ground surface
Grout cap
Grout holes @ 10' ± crs.
℄ Cutoff trench
Top of firm formation
Strawberry River
Stripping as directed
Access Road
Selected material from required excavation compacted in 12-inch layers by tamping roller.
Volume 4,836,000 C.Y.

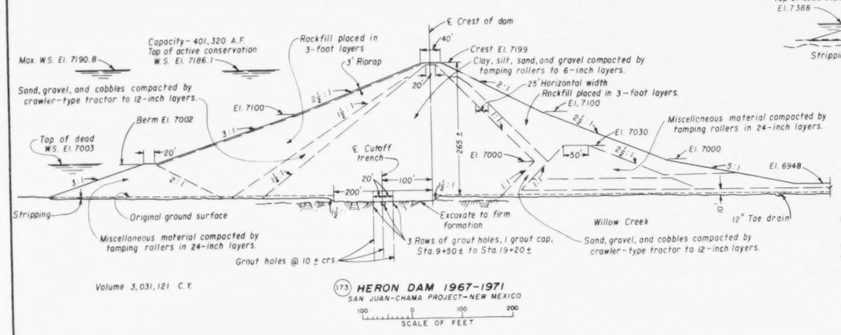
(166) **STARVATION DAM 1967–1970**
CENTRAL UTAH PROJECT–UTAH


Top of dead capacity, El. 397
Silt, sand, gravel, and cobbles compacted by tamping rollers to 12-inch layers
Maximum water surface, El. 546.2
Capacity – 55,891 A.F.
Top of active conservation capacity, El. 541
℄ Crest of dam
Clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers.
Crest El. 555
El. 539
Sand and gravel compacted by crawler-type tractors in 12-inch layers.
El. 450
20' to El. 450
Rockfill placed in 3-foot layers width varies
℄ Service road
35'
3' Riprap on 18" bedding
El. 355
25'
Rockfill placed in 3-foot layers
El. 420
Rockfill placed in 3-foot layers.
Top of inactive capacity, El. 403
Original ground surface
Remove unstable low density material
Grout cap
Assumed firm formation
Grout holes at approximately 10' crs.
River channel excavation – excavate to firm formation
12" Dia. C.M.P.
12" Dia. perforated C.M.P.
Silt, sand, gravel, and cobbles compacted by tamping rollers to 12-inch layers
Toa Vaca River
Volume 3,000,000 C.Y.

(PR) **TOA VACA DAM 1969–1971**
PUERTO RICO WATER RESOURCES AUTHORITY


Capacity – 1,106,500 A.F.
Top of active conservation capacity, El. 7602.4
Max. W.S. El. 7603.6
Selected clay, silt, sand, gravel, and cobbles compacted by tamping rollers to 6-inch layers
Limits of cutoff trench and special compaction
Crest El. 7612
Selected silt, sand, gravel, and cobbles compacted by rubber-tired rollers to 12-inch layers
3' Riprap – 18" bedding
El. 7530
El. 7520
El. 7500
Selected sand, gravel, and cobbles compacted by crawler-type tractors to 12-inch layers.
Top of inactive capacity, El. 7525
Selected silt, sand, gravel, and cobbles compacted by rubber-tired rollers to 12-inch layers
Top of dead capacity, El. 7388
℄ Grout cap
El. 7440
Rockfill placed in 3-foot layers – Embankment toe drain
El. 7369
Stripping as directed
Assumed firm formation
Grout holes at approximately 10' crs.
Strawberry River
Miscellaneous material compacted by rubber-tired rollers to 12-inch layers.
Volume 3,191,400 C.Y.
SCALE OF FEET

(165) **SOLDIER CREEK DAM 1970–1973**
CENTRAL UTAH PROJECT–UTAH


Max. W.S. El. 7190.8
Capacity – 401,320 A.F.
Top of active conservation W.S. El. 7186.1
Rockfill placed in 3-foot layers
3' Riprap
℄ Crest of dom
Crest El. 7199
Clay, silt, sand, and gravel compacted by tamping rollers to 6-inch layers.
25' Horizontal width
Rockfill placed in 3-foot layers.
Sand, gravel, and cobbles compacted by crawler-type tractor to 12-inch layers.
El. 7100
Berm El. 7002
Top of dead W.S. El. 7003
℄ Cutoff trench
El. 7030
El. 7000
El. 6948
Miscellaneous material compacted by tamping rollers in 24-inch layers.
Stripping
Original ground surface
Miscellaneous material compacted by tamping rollers in 24-inch layers.
Excavate to firm formation
3 Rows of grout holes, 1 grout cap, Sta. 9+50± to Sta. 19+20±
Willow Creek
Sand, gravel, and cobbles compacted by crawler-type tractor to 12-inch layers.
12" Toe drain
Grout holes @ 10 ± crs.
Volume 3,031,121 C.Y.

(173) **HERON DAM 1967–1971**
SAN JUAN–CHAMA PROJECT–NEW MEXICO
SCALE OF FEET

Clay, silt, and sand compacted by tamping rollers to 6-inch layers
Maximum water surface, El. 5974.2
Capacity 1,800 A.F.
Top of active conservation capacity, El. 5963.9
6" Selected roadway surfacing
℄ Crest of dam
Crest El. 5980
Silt and sand compacted by tamping rollers to 6-inch layers
Silt, sand, and sandstone fragments compacted by tamping rollers to 6-inch layers
Top of inactive capacity
El. 5950.0
Soil cement slope protection
15' Berm
Sand, gravel, and cobble slope protection
El. 5940
Top of dead capacity, El. 5914
El. 5915.0
Waste disposal below El. 5914
Original ground surface
℄ Cutoff trench and ℄ grout cap
Elevation variable
Max elevation of bottom of drainage blanket 5920.0
Assumed bottom of organic silt and clay layer
Toe drain
Sand, gravel and cobble drainage blanket
Grout cap
Grout holes @ 10' ± crs.
Assumed surface of firm formation
Offstream
Volume 683,000 C.Y.
SCALE OF FEET

(171) **CUTTER DAM 1970–1972**
NAVAJO INDIAN IRRIGATION PROJECT–NEW MEXICO

ALWAYS THINK **SAFETY**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

EARTHFILL DAMS
MAXIMUM SECTIONS
STARTED BETWEEN 1966 AND 1970

DESIGNED: Charles F. Luckel — SUBMITTED: Richard B. Cook
DRAWN: A. L. Cook — RECOMMENDED:
CHECKED: R. C. Crowley — APPROVED: Jack W. Hoyt
CHIEF, DIVISION OF DESIGN

DENVER, COLORADO, MAY 21, 1973
SHEET 19

103-D-1361

SUMMARY OF EARTHWORK CONTROL STATISTICS

TABLE I

DAM	Dam identification Number	Year completed	Number of tests	General soil classification	AVERAGES											DISTRIBUTION-PERCENTAGE OF TESTS							STANDARD DEVIATIONS		
																MOISTURE CONTROL			DRY UNIT WEIGHT CONTROL						
					Liquid limit	Plasticity index	Percentage Plus #4	Water content (minus #4) (wf) % by dry weight	Dry density compaction cyl (minus #4) pcf	Dry density fill (minus #4) pct	Proctor max dry density (minus #4) pcf	Water content opt (wo) (minus #4) % by dry weight	$w_o - w_f$	C in percent	D in percent	Drier than $w_o - 3.2$	Between $w_f + 0.2$ $w_o - 3.2$	Wetter than $w_f + 0.2$	Less than 95 % max.	Between 95 % max 98 % max.	Between 98 % mx. % max.	Greater than % max.	$w_o - w_f$	C	D
Green Mountain	51	1943	1066	SC	21.3	7.6	35.2	8.4	131.9	131.8	131.9	8.8	0.4	99.9	99.9	0.2	87.1	12.7	5.5	15.5	35.0	44.0	±0.6	☆	±2.2
Deerfield	60	1946	60	☆	☆	☆	19.1	13.1	119.2	118.1	119.2	13.1	0.0	99.1	99.1	0.0	61.7	38.3	6.5	14.5	56.0	23.0	±1.4	☆	±1.6
Long Lake	74	1948	396	SM	17.8	0.2	0.0	14.9	106.3	108.5	108.7	17.0	2.1	102.1	99.8	27.3	65.1	7.6	6.5	21.0	24.0	48.5	±1.9	☆	±3.1
Angostura	65	1949	117	SC	22.0	7.0	20.0	11.2	120.9	123.3	122.2	11.7	0.5	102.0	100.9	2.6	80.3	17.1	3.5	14.5	16.5	65.5	±1.0	☆	±3.0
Heart Butte	79	1949	365	SM-SC CL	27.6 24.5	6.0 8.0	2.7	14.5	111.8	113.2	113.3	15.4	0.9	101.3	99.9	8.8	70.1	21.1	5.5	15.5	25.5	53.5	±1.6	☆	±2.8
Medicine Creek	82	1949	1347	ML	19.5	1.0	0.0	16.3	106.3	105.0	107.7	17.3	1.0	98.8	97.5	6.0	88.4	5.6	18.0	37.0	26.0	19.0	±1.3	☆	±2.8
O'Sullivan	75	1949	1739	SM-ML	22.0	N.P.	0.0	16.3	103.6	105.9	105.2	17.7	1.4	102.2	100.7	14.1	67.9	18.0	8.0	10.0	20.0	62.0	±1.9	☆	±3.3
Dry Falls (South Coulee)	71	1949	410	SM	☆	☆	6.5	16.9	102.6	103.5	105.2	19.1	2.2	100.9	98.4	27.5	61.0	11.5	18.0	26.0	22.0	34.0	±1.9	☆	±3.6
Horsetooth	73	1949	285	CL	26.0	11.6	2.2	11.7	108.1	112.6	114.9	13.9	2.2	104.2	98.0	28.4	64.9	6.7	23.5	25.5	18.0	33.0	±1.7	☆	±4.0
Soldier Canyon	76	1949	294	CL	27.0	12.8	1.9	11.6	108.3	112.1	114.1	14.2	2.6	103.5	98.2	33.3	60.6	6.1	20.0	25.0	21.0	34.0	±1.8	☆	±4.1
Jackson Gulch	80	1949	203	CL	40.3	21.3	5.2	18.9	97.4	100.7	100.4	21.4	2.5	103.4	100.3	35.0	53.7	11.3	12.0	15.5	20.0	52.5	±3.1	☆	±4.1
Dixon Canyon	70	1949	240	CL	27.0	12.8	1.0	12.1	107.7	111.2	112.9	14.9	2.8	103.2	98.5	41.3	55.0	3.7	17.0	27.0	21.5	34.5	±1.7	☆	±3.7
Spring Canyon	77	1949	221	CL	28.8	14.0	3.2	12.0	106.6	111.3	112.6	14.9	2.9	104.4	98.8	40.3	58.3	1.4	14.0	21.0	20.0	45.0	±1.5	☆	±3.7
Olympus	83	1949	79	SM	17.6	N.P.	0.9	10.2	117.5	116.5	120.1	11.6	1.4	99.1	97.0	13.9	81.0	5.1	31.0	23.0	16.0	30.0	±1.8	☆	±5.0
Granby	67	1950	550	SC	21.6	7.6	27.2	9.6	126.0	126.8	127.0	10.0	0.4	100.6	99.8	1.1	77.1	21.8	3.5	18.0	26.5	52.0	±1.1	☆	±2.4
Anderson Ranch	57	1950	2139	SC	28.2	12.2	11.0	12.3	117.8	120.3	119.9	12.8	0.5	102.1	101.2	1.4	76.0	22.6	0.0	4.5	24.0	71.5	±1.0	☆	±2.1
Davis	59	1950	492	CL SM	31.4 21.3	12.5 1.0	15.1	10.8	119.2	120.7	120.7	12.0	1.2	101.3	100.0	10.8	71.5	17.7	6.0	19.0	23.5	51.5	±1.7	☆	±2.9
Dickinson	86	1950	279	SM	☆	☆	1.2	13.7	111.1	112.3	113.2	15.3	1.6	101.1	99.2	14.7	71.7	13.6	5.0	17.5	42.5	35.0	±1.6	☆	±2.0
Platoro	91	1951	304	GC-SC	30.0	12.7	39.3	11.8	122.5	118.8	123.3	12.2	0.4	97.0	96.4	0.0	80.9	19.1	27.5	38.0	18.0	16.5	±0.8	☆	±3.7
Bonny	84	1951	2100	ML-SM	21.0	1.5	0.0	14.2	106.9	109.7	108.5	15.2	1.0	102.6	101.1	8.7	71.5	19.8	3.0	7.0	20.5	69.5	±1.6	☆	±2.3
Cedar Bluff	85	1951	2692	CL	25.8	12.0	0.0	13.7	109.1	110.1	111.0	14.8	1.1	100.9	99.2	11.1	67.8	21.1	9.5	22.5	25.0	43.0	±1.8	☆	±2.6
Enders	72	1951	888	ML	20.2	1.0	0.0	13.2	109.4	111.6	111.5	14.5	1.3	102.0	100.1	10.2	75.8	14.0	5.5	15.5	24.0	55.0	±1.7	☆	±2.7
North Coulee	89	1951	291	ML	21.6	1.4	0.0	15.7	100.8	101.5	103.0	18.2	2.5	100.7	98.5	33.7	52.9	13.4	12.5	28.0	23.5	36.0	±2.2	☆	±3.0
Shadehill	88	1951	1042	SC	25.3	10.2	26.1	11.8	119.3	119.7	121.2	13.0	1.2	100.3	98.8	6.0	84.4	9.6	11.5	23.0	33.0	32.5	±1.4	☆	±3.1
Shadehill Dike	88	1951	85	CL	31.0	10.0	0.0	17.3	101.8	102.0	103.0	18.9	1.6	100.2	99.0	15.3	75.3	9.4	1.5	20.0	41.0	37.5	±1.7	☆	±1.8
Boysen	78	1952	863	SM-SC GM-GP	20.7 18.5	4.7 2.0	35.3	11.1	120.5	122.9	122.0	11.4	0.3	102.0	100.7	3.2	62.5	34.3	12.0	14.0	23.0	51.0	±1.5	☆	±4.6
Big Sandy	98	1952	262	SM	☆	☆	2.0	16.6	106.6	111.0	107.7	17.5	0.9	104.1	103.1	8.4	72.9	18.7	0.0	4.5	16.0	79.5	±1.5	☆	±3.3
Carter Lake	94	1952	839	CL	28.0	13.8	6.0	13.4	111.2	113.7	112.9	14.8	1.4	102.2	100.7	7.2	85.2	7.6	2.5	13.0	26.5	58.0	±1.3	☆	±4.5
Keyhole	99	1952	486	ML-CL	☆	☆	Neg.	13.8	111.9	112.5	113.2	14.5	0.7	100.5	99.4	2.9	75.4	21.7	4.0	16.5	42.5	37.0	±1.4	☆	±1.7
Lauro	101	1952	249	SC	☆	☆	16.1	11.4	113.0	118.2	116.0	13.3	1.9	104.6	101.9	17.7	76.7	5.6	1.5	8.0	14.0	76.5	±1.4	☆	±3.0
Rattlesnake	102	1952	157	SM	23.3	3.8	5.3	12.1	114.4	116.3	115.5	13.5	1.4	101.7	100.7	10.2	80.2	9.6	5.0	23.0	25.0	47.0	±1.4	☆	±2.8
Cachuma	93	1953	1324	SC-SM	25.5	6.3	36.3	13.8	113.8	112.3	114.8	14.6	0.8	98.7	97.8	1.6	85.2	13.2	17.0	31.5	25.0	26.5	±1.1	☆	±3.1
Falcon (Schedule #1)		1953	385	ML-CL	23.0	9.0	6.2	13.3	109.2	111.4	111.5	15.0	1.7	102.0	99.9	11.9	83.2	4.9	5.0	17.0	26.0	52.0	±1.4	☆	±2.5
Falcon (Schedule #2)		1953	2354	ML-CL	22.0	6.0	2.2	11.6	117.1	116.8	118.8	12.7	1.1	99.7	98.3	8.5	78.0	13.5	9.0	31.5	34.0	25.5	±1.4	☆	±2.3
Jamestown	104	1953	381	CL	28.9	11.6	5.0	18.5	99.4	103.0	101.4	20.1	1.6	103.6	101.6	7.1	85.0	7.9	2.5	7.0	21.0	69.5	±1.2	☆	±3.2
Ortega	106	1953	70	CL-CH	40.0	24.0	0.9	13.5	114.7	115.6	115.5	14.3	0.8	100.8	100.1	0.0	87.1	12.9	0.0	7.0	41.0	52.0	±0.9	☆	±1.4
Trenton (Foundation)	92	1953	1448	ML-CL	27.0	6.0	0.0	16.5	105.1	106.1	106.5	17.0	0.5	101.0	99.6	6.0	51.5	32.5	4.0	17.0	34.0	45.0	±1.8	☆	±2.1
Trenton	92	1953	3185	ML-CL	27.0	6.0	0.0	16.5	104.5	106.5	105.8	17.2	0.7	101.9	100.7	4.5	73.2	22.3	0.5	7.5	31.0	61.0	±1.5	☆	±2.3
Willow Creek (Colorado)	96	1953	203	SC	41.5	21.0	24.6	15.7	108.0	110.3	109.5	16.7	1.0	102.1	100.7	1.0	86.7	12.3	4.5	7.5	28.5	59.5	±1.1	☆	±2.4
Flatiron	97	1953	222	SC-CL	26.8	8.4	4.2	13.0	114.5	116.4	115.5	13.7	0.7	101.7	100.8	1.8	75.7	22.5	0.0	10.0	30.0	60.0	±1.2	☆	±2.1

☆ Data not available ☆☆ Compaction primarily by equipment travel NOTE - All materials are Zone I except as noted

SUMMARY OF EARTHWORK CONTROL STATISTICS

TABLE I-CONTINUED

DAM	Dam identification Number	Year completed	Number of tests	General soil classification	AVERAGES: Liquid limit	Plasticity index	Percentage Plus #4	Water content (minus #4) (wf) % by dry weight	Dry density compaction cyl (minus #4) pct	Dry density fill (minus #4) pct	Proctor max dry density (minus #4) pct	Water content opt (w_o)(minus #4) % by dry weight	w_o - wf	C in percent	D in percent	DISTRIBUTION-PERCENTAGE OF TESTS: MOISTURE CONTROL: Drier than w_o-3.2	Between w_o+0.2 w_o-3.2	Wetter than w_o+0.2	DRY UNIT WEIGHT CONTROL: Less than 95 % max.	Between 95 % max. 98 % max.	Between 98 % max. % max.	Greater than % max.	STANDARD DEVIATIONS: w_o - wf	C	D
Vermejo #1(Stubble Field)	112	1954	381	CL	34.7	18.4	2.0	17.2	108.4	110.0	109.8	17.9	0.7	101.5	100.2	2.4	75.0	22.6	6.5	18.5	26.5	48.5	±1.1	☆	±3.6
Kirwin	105	1955	3803	CL	42.0	15.0	0.0	18.8	101.9	103.6	102.7	19.2	0.4	101.7	100.9	2.3	71.1	26.6	0.5	6.0	29.0	64.5	±1.0	±2.2	±2.0
Sly Park	116	1955	226	CL	36.0	14.0	1.1	15.2	111.1	110.6	111.8	15.0	-0.2	99.5	98.9	0.0	51.3	48.7	7.0	23.0	29.0	41.0	±1.2	±2.6	±2.6
Weber Aqueduct		1955	50	CL	29.0	13.0	0.0	15.7	111.2	109.0	111.9	15.9	0.2	98.0	97.4	2.0	62.0	36.0	17.5	23.0	39.5	20.0	±1.3	☆	±2.8
Alamogordo (Enlarg.)	39	1956	92	SC	23.0	12.0	5.9	11.6	115.0	120.4	116.3	12.5	0.9	104.7	103.5	0.0	95.7	4.3	0.0	4.5	7.0	88.5	±0.7	☆	±2.4
Pactola	107	1956	1037	CL CL	30.0 38.0	12.0 19.0	12.0	15.5	111.4	111.6	112.4	16.0	0.5	100.2	99.3	3.6	71.7	24.7	2.0	24.0	34.0	40.0	±1.4	☆	±2.3
Tiber (Main Embankment)	108	1956	853	ML CL	23.0 19.0	2.0 10.0	5.8	14.2	112.3	114.7	113.6	14.8	0.6	102.1	101.0	4.9	72.1	23.0	2.0	14.0	18.0	66.0	±1.6	☆	±3.2
Tiber (Dike)	108	1956	280	CL-CH	48.0	28.0	0.0	19.7	102.0	104.5	103.4	19.9	0.2	102.5	101.1	5.7	55.0	39.3	3.0	12.0	19.0	66.0	±1.8	☆	±3.0
Webster	109	1956	3042	CL	37.0	19.0	0.0	17.6	104.5	106.6	105.2	18.0	0.4	102.0	101.3	2.6	69.0	28.4	1.5	9.0	21.0	68.5	±1.2	±2.8	±2.8
Palisades	113	1957	2108	ML	26.0	4.0	3.3	15.7	107.4	107.4	108.7	16.5	0.8	100.0	98.8	6.0	68.1	25.9	11.0	24.0	26.0	39.0	±1.7	☆	±3.5
Haystack	122	1957	110	SM-ML	☆	N.P.	5.9	20.3	98.8	98.2	100.5	21.2	0.9	99.4	97.7	3.6	81.9	14.5	15.0	35.0	23.0	27.0	±1.4	☆	±2.8
Lovewell	119	1957	1330	CL	44.0	26.0	0.0	18.2	104.8	105.8	105.4	18.5	0.3	101.0	100.4	0.6	52.5	46.9	0.0	6.0	38.0	56.0	±1.3	☆	±1.7
Pineview (Enlarg.)	33	1957	51	GM	☆	☆	20.3	14.3	117.9	116.4	119.6	13.7	-0.6	98.7	97.3	0.0	39.2	60.8	11.5	34.0	32.0	22.5	±1.5	☆	±2.3
Wanship	120	1957	845	CL	26.0	12.0	2.6	13.9	112.8	115.2	114.0	14.5	0.6	102.1	101.1	2.7	74.5	22.8	2.0	11.5	19.5	67.0	±1.3	☆	±2.6
Glendo	118	1958	716	ML	☆	☆	2.6	16.4	108.0	109.0	108.2	16.8	0.4	100.9	100.7	1.4	75.0	23.6	0.0	9.0	34.0	57.0	±1.1	☆	±1.9
Helena Valley	126	1958	81	SC-CL	29.0	12.0	23.2	14.9	111.8	111.1	113.0	15.3	0.4	99.4	98.3	2.5	61.7	35.8	12.0	32.0	24.0	32.0	±1.3	☆	±2.9
Twitchell (Vaquero)	125	1958	1022	CL GM-ML	41.0 30.0	24.0 5.0	19.4	20.1	101.0	101.2	101.7	20.5	0.4	100.2	99.5	2.1	74.8	23.1	4.5	19.0	34.0	42.5	±1.2	±2.7	±2.2
Casitas	121	1959	1621	CL	28.0	11.0	2.5	13.8	114.2	115.3	114.9	14.9	1.1	101.0	100.3	4.2	85.4	10.4	1.5	14.0	27.5	57.0	±1.2	☆	±2.4
Fort Cobb	131	1959	2415	SM	☆	N.P.	0.0	11.9	112.2	114.8	113.3	12.9	1.0	102.3	101.3	4.3	76.8	18.9	0.2	2.0	22.6	75.2	±1.3	±2.6	±2.6
Vega	129	1959	412	SC-CL	40.0	17.0	18.8	17.8	106.8	106.6	107.3	18.2	0.4	99.8	99.3	0.7	76.5	22.8	3.6	32.6	36.6	27.2	±1.0	☆	±2.2
Keene Creek	127	1959	53	SC	49.0	15.0	7.5	41.5	78.3	76.8	78.7	40.7	-0.8	98.1	97.6	1.9	20.7	77.4	18.9	37.7	22.1	21.3	±1.2	☆	±3.3
Little Wood River	133	1960	263	GC-CL	45.0	19.0	28.5	19.7	98.3	99.0	99.8	21.2	1.5	100.7	99.2	7.2	91.6	1.2	1.9	29.7	42.9	25.5	±1.0	±3.1	±2.6
Foss	132	1961	3893	SM CL	☆ 38.7	N.P. 19.3	0.0	15.3	111.1	113.2	112.2	15.6	0.3	101.9	101.0	0.9	62.8	36.3	0.1	1.4	32.2	66.3	±1.3	±2.1	±2.0
Steinaker	142	1961	533	CL	32.0	15.0	0.0	14.1	112.8	114.6	114.1	15.1	1.0	101.6	100.5	0.9	90.8	8.3	1.7	8.4	31.5	58.4	±1.0	±2.5	±2.3
Emigrant (except Area J)	130	1961	251	CL	32.0	16.0	25.9	13.4	109.1	110.9	111.1	15.1	1.7	101.7	99.9	9.9	81.6	8.5	7.2	23.9	21.3	47.6	±1.3	±4.2	±3.8
Emigrant (Area J)	130	1961	44	CH	69.0	48.0	33.8	22.5	90.0	92.5	92.2	24.8	2.3	102.8	100.4	27.3	70.5	2.2	15.9	25.0	9.1	50.0	±1.7	±6.3	±6.5
Prineville	135	1961	560	SM-ML	34.0	4.0	35.9	17.7	107.9	109.9	108.6	18.0	0.3	101.9	101.2	0.0	77.1	22.9	0.4	11.8	20.2	67.6	±1.0	±2.6	±2.6
Trinity	128	1962	4841	SM-SC	28.5	6.3	32.0	16.0	112.8	112.6	113.8	17.2	1.2	99.8	98.9	0.6	93.1	6.3	7.0	28.8	27.8	36.4	±0.8	±3.1	±3.0
Trinity (Zone 2)	128	1962	958	GM	☆	☆	42.5	15.6	113.3	108.0	114.6	16.5	0.9	95.3	94.2	4.1	81.0	14.9	50.5	20.6	13.5	15.4	±1.3	±5.2	±5.0
Navajo	134	1962	5541	CL SM	28.0 20.0	10.0 3.0	1.2	13.7	114.6	116.3	115.7	14.5	0.8	101.5	100.5	1.0	88.1	10.9	0.2	5.6	31.1	63.1	±0.9	±2.0	±1.8
Twin Buttes	145	1962	7249	CL	29.0	17.0	7.5	16.4	108.9	111.4	109.7	16.9	0.6	102.3	101.5	0.5	84.1	15.4	0.2	1.9	24.1	73.9	±1.0	±2.7	±2.3
Red Willow	144	1962	1914	ML	25.0	3.0	0.0	17.3	105.2	106.8	106.0	17.7	0.4	101.5	100.8	0.8	67.2	32.0	0.1	1.9	36.0	62.0	±1.3	±2.2	±2.0
Prosser Creek	138	1962	481	GM-GC	32.2	12.1	31.3	18.7	105.6	105.1	107.2	19.1	0.4	99.5	98.1	1.7	70.0	28.3	15.8	29.1	25.7	29.4	±1.6	±2.9	±2.8
☆☆Willard (2nd Stage)	188	1962	1992	CL-ML	25.0	5.0	1.4	16.4	110.1	109.9	111.9	16.6	0.2	99.8	98.2	5.1	58.1	36.8	7.6	37.9	30.1	24.4	±1.7	±2.4	±2.4
Crawford	143	1962	334	GC	36.0	17.0	21.3	17.0	106.7	108.8	107.7	17.9	0.9	102.0	101.0	3.9	75.5	20.6	0.9	6.9	29.0	63.2	±1.4	±2.9	±2.6
Sherman	141	1962	1475	CL	32.0	16.0	0.0	18.5	104.5	106.4	105.6	17.7	-0.8	101.9	100.8	1.3	29.5	69.2	0.7	1.0	34.2	64.1	±1.3	±2.1	±2.0
Twin Buttes (Zone 3)	145	1962	570	CL	27.0	14.0	17.8	14.6	113.4	116.5	114.3	15.4	0.8	102.8	101.9	2.6	80.2	17.2	0.9	4.0	21.1	74.0	±1.3	±3.1	±2.9
Twin Buttes (Zone 4)	145	1962	1164	CL	39.0	18.0	9.3	17.6	105.3	107.1	106.1	18.5	0.9	101.7	101.0	1.8	85.7	12.5	0.2	8.7	26.1	65.0	±1.2	±2.6	±2.4
Paonia	137	1962	419	CL	27.0	13.0	6.4	13.2	112.9	115.7	114.0	14.1	0.9	102.5	101.5	1.5	85.4	13.1	0.5	4.1	16.2	79.2	±1.1	±2.3	±2.1
Bully Creek	148	1963	318	ML	34.0	7.0	7.7	23.7	92.7	92.9	93.9	24.9	1.2	100.1	98.9	6.9	78.6	14.5	2.8	32.7	33.1	31.4	±1.4	±2.6	±2.4

☆ Data not available ☆☆ Compaction primarily by equipment travel NOTE: All materials are Zone 1 except as noted

SUMMARY OF EARTHWORK CONTROL STATISTICS
TABLE I

DAM	DAM IDENTIFICATION NUMBER	YEAR COMPLETED	NUMBER OF TESTS	GENERAL SOIL CLASSIFICATION	AVERAGES											DISTRIBUTION-PERCENTAGE OF TESTS							STANDARD DEVIATIONS		
																MOISTURE CONTROL			DRY UNIT WEIGHT CONTROL						
					LIQUID LIMIT	PLASTICITY INDEX	PERCENTAGE PLUS #4	WATER CONTENT (MINUS #4) % BY DRY WEIGHT	DRY DENSITY COMPACTION CYL (MINUS #4) pcf	DRY DENSITY FILL (MINUS #4) pcf	PROCTOR MAX. DRY DENSITY (MINUS #4) pcf	WATER CONTENT OPT. (W_O) (MINUS #4) % BY DRY WEIGHT	W_O-Wf	C IN PERCENT	D IN PERCENT	DRIER THAN W_O-3.2	BETWEEN W_O+0.2 W_O-3.2	WETTER THAN W_O+0.2	LESS THAN 95 Yd MAX.	BETWEEN 95 Yd MAX. 98 Yd MAX.	BETWEEN 98 Yd MAX Yd MAX.	GREATER THAN Yd MAX.	W_O-Wf	C	D
Lewiston	151	1963	209	GM-GC	31	10	30.1	16.6	112.6	112.3	113.4	16.8	0.2	99.7	99.1	0.5	62.7	36.8	9.6	25.8	18.7	45.9	±1.1	±3.6	±3.5
Whiskeytown	146	1963	1066	SM-ML	27	7	14.5	13.0	114.4	115.0	115.8	14.0	1.0	100.6	99.3	0.8	7.0	12.2	3.5	26.7	28.0	11.8	±1.1	±2.9	±2.6
Lemon	150	1963	911	GC-CL	31	12	23.1	12.0	121.0	121.6	121.8	12.1	0	100.5	99.9	0	60.6	39.4	0.1	14.7	35.3	49.8	±1.0	±1.9	±1.9
Spring Creek Debris	156	1963	692	SM-ML	–	–	11.3	11.2	119.5	120.3	121.3	12.4	1.2	100.8	99.2	2.9	84.7	12.4	4.5	27.0	28.5	40.1	±1.2	±3.4	±2.8
Willard (3rd stage)	188	1964	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Merritt	152	1964	508	SM	–	–	0.1	9.5	108.3	115.2	109.8	12.4	3.0	106.5	105.0	45.1	36.2	18.7	0.2	0.2	6.1	93.5	±2.8	±3.0	±3.1
Clark Canyon	154	1964	617	SM-ML	–	–	22.5	13.1	115.9	117.2	116.9	13.7	0.6	101.2	100.3	3.7	72.1	24.1	2.1	11.3	27.9	58.7	±1.4	±2.4	±2.3
Norton	159	1964	1801	SM-ML	–	–	0	18.2	104.1	105.3	104.7	18.7	0.5	101.2	100.5	0.7	73.9	25.4	0	0.1	39.3	60.6	±1.1	±1.7	±1.6
Fontenelle	155	1964	949	SC-CL	31	13	13.0	12.3	116.1	119.4	117.6	13.1	0.7	102.7	101.7	*	*	*	*	*	*	*	±1.1	±2.7	±2.5
Harmon	158	1965	813	CL	33	17	0	15.8	110.4	112.8	111.5	15.8	0.4	102.2	101.1	1.7	67.5	30.8	0	1.5	32.8	65.7	±1.4	±2.3	±2.1
Cheney	149	1965	3277	SC-CL	31	16	0	15.3	111.0	114.4	111.9	16.0	0.7	103.1	102.2	1.3	81.6	17.1	0	1.5	14.6	83.9	±1.1	±2.8	±2.3
Sanford (Borrow Areas B & M)	153	1965	3394	SM-CL	24	10	0	14.7	112.2	115.0	113.2	15.4	0.7	102.5	101.6	*	*	*	*	*	*	*	±1.1	±2.3	±2.0
Sanford (Borrow Area J)	153	1965	1493	ML-CL	21	7	0	11.8	117.9	119.7	119.1	12.7	0.9	101.5	100.5	1.6	86.9	11.5	0.1	4.8	36.6	58.5	±0.9	±2.1	±1.7
Los Banos	175	1965	397	CL-CH	48	26	6.5	18.5	103.4	105.5	104.5	19.5	1.0	102.1	101.0	7.3	76.1	16.6	0.3	8.3	25.2	66.2	±1.5	±2.6	±2.3
Lost Creek (DC-5935)	176	1965	257	GM-SM	21	3	7.4	14.2	113.6	115.3	114.8	14.9	0.7	101.5	100.4	*	*	*	*	*	*	*	±0.8	±2.3	±1.9
Lost Creek (DC-5935B)	176	1966	252	GM-SM	21	3	9.7	13.1	116.1	117.3	117.4	13.6	0.5	101.1	100.0	*	*	*	*	*	*	*	±1.0	±2.1	±2.0
Causey	157	1966	382	GM-GC	29	12	14.3	14.8	112.8	114.7	113.8	15.3	0.5	101.8	100.9	*	*	*	*	*	*	*	±1.0	±2.5	±2.2
Blue Mesa	147	1966	703	GC	28	10	18.6	17.5	106.7	108.1	107.4	18.3	0.7	101.4	100.7	0.9	87.6	11.5	0.7	9.0	28.7	61.6	±1.0	±2.7	±2.3
Little Panoche	177	1966	307	CL	28	12	11.8	13.2	115.6	119.0	116.9	14.4	1.2	102.9	101.8	*	*	*	*	*	*	**	±1.2	±2.5	±2.4
Joes Valley	174	1966	660	CL	28	14	3.3	13.0	116.5	117.2	117.3	13.4	0.4	100.6	99.9	0	79.4	20.6	0.5	17.9	30.7	50.9	±0.9	±2.3	±2.2
Senator Wash	184	1966	479	SM-ML	–	–	14.7	12.8	114.2	116.1	116.3	13.4	0.6	101.7	99.9	*	*	*	*	*	*	*	±1.5	±3.2	±3.0
Arbuckle	169	1966	904	CL	32	20	4.8	14.1	109.4	113.6	111.3	15.6	1.5	104.0	102.1	6.9	87.6	5.5	0.3	4.9	17.6	76.9	±1.2	±3.4	±2.7
Huntington North	172	1966	483	CL	27	10	0	13.2	–	117.2	116.1	13.6	0.4	–	100.9	0	90.0	10.0	0	11.0	25.0	64.0	±0.7	–	±2.7
Agate	168	1966	130	GW-GC	53	28	47.7	19.4	101.1	102.6	102.6	20.8	1.4	101.5	100.1	10.8	82.3	6.9	3.8	17.7	26.9	51.5	±1.4	±3.2	±2.8
Mann Creek (Formerly Spangler)	179	1967	181	SC-CL	30	15	0	18.3	103.9	105.9	105.0	19.3	1.0	102.0	100.9	1.7	93.4	5.0	0	8.8	17.1	74.0	±0.9	±2.3	±2.0
Rifle Gap	182	1967	52>	CL	31	16	0.5	13.4	117.4	119.3	118.2	14.0	0.6	101.6	100.9	0	87.6	12.4	0.6	3.0	29.1	67.3	±0.8	±2.1	±2.0
Contra Loma	170	1967	139	CL-CH	43	23	0.1	21.0	99.9	100.8	100.0	21.6	0.6	101.2	100.8	0.5	81.9	17.6	0	2.0	35.7	62.3	±1.2	±2.5	±1.9
O'Neill Forebay Dam	161	1967	931	CL	35	14	18.8	14.2	112.1	115.8	118.1	15.2	1.0	103.4	102.4	*	*	*	*	*	*	*	±1.2	±2.9	±2.8
San Luis	160	1967	12,780	CL	35	14	13.4	14.5	111.1	114.7	112.3	15.7	1.2	103.3	102.2	3.7	87.7	8.6	0.2	5.3	16.1	78.3	±1.2	±3.0	±2.8
Sugar Loaf	185	1968	639	GM-SM	–	–	24.1	7.7	128.1	131.3	130.4	8.9	1.2	102.5	100.7	0.2	99.7	0.2	1.7	11.9	22.4	64.0	±0.6	±2.8	±2.5
Mason	180	1968	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Ruedi	183	1968	697	GM-GC	30	13	35.1	12.8	117.1	116.9	117.7	13.2	0.4	99.9	99.4	0.1	78.2	21.7	1.4	24.8	33.6	40.2	±0.9	±2.3	±2.2
Downs Dike (Stage I)	164	1968	245	CL	33	13	0	18.9	102.5	104.4	103.4	19.6	0.7	101.9	101.0	0.8	81.6	17.6	0	1.2	29.4	69.4	±1.3	±2.0	±1.8
Downs Dike (Completion)	164	1969	1,079	CL	33	13	0	19.0	102.9	104.6	103.8	19.3	0.8	101.7	100.8	2.0	62.1	35.9	0	6.4	27.9	65.7	±1.5	±2.0	±1.9
Glen Elder	162	1969	4,284	CL	38	19	0.1	18.7	102.8	105.9	103.6	19.5	0.8	103.0	102.1	2.1	82.6	15.2	0	2.5	14.0	83.5	±1.2	±2.5	±2.3
Cowker City Dike	163	1969	908	CL	39	22	0	18.0	104.5	106.9	105.4	18.6	0.6	102.3	101.4	2.0	75.1	22.9	0	4.8	22.5	72.7	±1.3	±2.3	±2.1
Starvation(Borrow Area D)	166	1970	515	SM-ML	–	–	0	10.6	119.2	124.7	121.2	11.7	1.1	104.6	102.9	1.4	88.0	10.7	0	4.3	8.5	87.2	±1.1	±2.9	±2.6
Starvation(Borrow Area E)	166	1970	609	GM-GC	26	10	22.5	15.2	109.4	113.3	110.8	16.3	1.1	103.6	102.3	0.5	96.2	3.3	.5	7.2	14.8	77.5	±0.9	±3.1	±3.0
Tiber Cofferdam	108	1970	146	CL-CH	48	28	0.3	19.6	103.7	106.9	104.4	20.1	0.5	103.1	102.4	0.7	82.9	16.4	0	0	8.9	91.1	–	–	–
Bottle Hollow	167	1970	67	SM	24	4	0.1	9.6	123.9	128.3	125.6	10.6	1.0	103.5	102.1	*	*	*	*	*	*	*	±0.9	±2.9	±2.2
Stampede	187	1970	1135	GM	43	13	46.1	23.0	100.8	100.6	101.4	23.1	0.1	99.8	99.2	0.4	67.6	32.0	2.8	31.9	24.9	40.4	±1.0	±2.7	±2.6
Meeks Cabin	181	1971	787	GM-GC	22	9	36.0	9.5	126.3	127.0	126.8	9.8	0.3	100.6	100.1	0	82.5	17.5	1.8	18.9	27.3	52.0	±0.7	±2.7	±2.6

* Data not available

NOTE: All material are Zone I

SUMMARY OF EARTHWORK CONTROL STATISTICS

TABLE 1-CONTINUED

DAM	DAM IDENTIFICATION NUMBER	YEAR COMPLETED	NUMBER OF TESTS	GENERAL SOIL CLASSIFICATION	AVERAGES											DISTRIBUTION-PERCENTAGE OF TESTS							STANDARD DEVIATIONS		
																MOISTURE CONTROL			DRY UNIT WEIGHT CONTROL						
					LIQUID LIMIT	PLASTICITY INDEX	PERCENTAGE PLUS #4	WATER CONTENT (MINUS #4), (wf) % BY DRY WEIGHT	DRY DENSITY COMPACTION CYL. (MINUS #4) pcf	DRY DENSITY FILL (MINUS #4) pcf	PROCTOR MAX. DRY DENSITY (MINUS #4) pcf	WATER CONTENT (w_O) (MINUS #4) % BY DRY WEIGHT	w_O-wf	C IN PERCENT	D IN PERCENT	DRIER THAN w_O-3.2	BETWEEN w_O+0.2 w_O-3.2	WETTER THAN w_O+0.2	LESS THAN 95 Yd MAX.	BETWEEN 95 Yd MAX. 98 Yd. MAX.	BETWEEN 98 Yd MAX. Yd MAX.	GREATER THAN Yd MAX.	w_O-wf	C	D
Silver Jack	186	1971	304	GM-GC	29	9	41.8	15.2	114.6	112.6	115.0	15.1	-0.1	98.3	97.9	0	68.4	31.6	12.8	37.8	30.6	18.7	±0.7	±2.6	±2.6
Heron	173	1971	891	CL-CH	46	29	2.2	16.5	108.0	110.1	108.5	17.3	0.7	101.9	101.5	0	90.5	9.5	0	2.9	23.1	74.0	±0.8	±2.2	±2.1
Cutter (Borrow Area B)	171	1972	214	SM	*	*	0	10.9	120.2	122.5	121.2	11.7	0.8	102.0	101.1	0.5	84.6	15.0	0	7.0	20.1	72.9	±1.1	±2.2	±2.0
Cutter (Borrow Area E)	171	1972	182	SM	*	*	1.8	9.8	120.7	123.8	121.9	10.8	1.1	102.6	101.6	2.2	81.3	16.5	0	2.2	18.1	79.7	±1.4	±2.2	±2.0
Pueblo (Initial Construction)		1972	*	ML-CL	28	9	13.4	13.3	116.4	117.7	117.4	13.8	0.5	101.2	100.2	*	*	*	*	*	*	*	-	-	-
Soldier Creek	165	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

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